This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

Eng
530
5

Green - Diving - 1859

GODFREY LOWELL CABOT SCIENCE LIBRARY
of the Harvard College Library

This book is
FRAGILE
and circulates only with permission.
Please handle with care
and consult a staff member
before photocopying.

Thanks for your help in preserving
Harvard's library collections.

DIVING

With & Without Armor:

CONTAINING THE

SUBMARINE EXPLOITS

OF

J. B. GREEN,

THE CELEBRATED SUBMARINE DIVER.

[illegible]

[illegible]

[illegible]

PRICE TWENTY-FIVE CENTS.

DIVING

With & Without Armor:

CONTAINING THE

SUBMARINE EXPLOITS

OF

J. B. GREEN,

THE CELEBRATED SUBMARINE DIVER.

BUFFALO:
FAXON'S STEAM POWER PRESS, NO. 88 MAIN ST.
1859.

Eng 52.09.59

HARVARD COLLEGE LIBRARY
FROM
THE BEQUEST OF
EVERT JANSEN WENDELL
19

Entered according to Act of Congress, in the year 1859, by
JOHN B. GREEN,
In the Clerk's Office of the District Court of the United States for the Northern District of New York.

WORDS PRELIMINARY.

The contents of the following pages which I now present to the public, embrace the whole period in which I was engaged in diving, both with and without submarine armor, and contains much that was omitted in my former edition. I have taken prudence as my guide in narrating each incident, and condensed what is sufficient for hundreds of pages, into this pamphlet. Thus, I have merely given facts, and left the reader to use his own judgment in forming theories. This perhaps, is the better way, for books which are filled with speculations, too often cast a shadow over that part of their pages which are true and really useful.

The readiness with which I disposed of my first edition, notwithstanding the small amount of matter it contained, convinces me that there is not a small portion of the community that feels no little interest in the subject of which I have endeavored to give a slight history; and which cost me my health, and made me a cripple for life. There is not a hope that I will ever recover.

I am no less aware of that assistance which I have received from friends and well-wishers, in the sale of my little book; which, as I cannot hope to return to my former occupation, is all my worldly goods, and store with which, to journey on, a cripple, through the world. I cannot express my heart-felt thankfulness for the most trifling aid.

I have endeavored to give in the following pages only facts—such as will be of value not only to *divers* but others; among which are the suggestions in regard to *floating*, which may save more than one reader from a watery grave, and which at least will repay the reader for the trifling expense he has incurred for this little volume.

J. B. G.

Buffalo Oct. 15*th*, 1859.

CONTENTS.

CHAPTER I.

Page.

Early Years, how spent: Moves to Ogdensburg: Learns to Swim: Removes thence to Oswego: Progress in Swimming: First sees Diving for Property, . 9

CHAPTER II.

The First Diving for Property: Success: The Idea of a Future Employment: The Resolve to adopt Submarine Wrecking, ... 10

CHAPTER III.

Familiarity with the Lake and Harbor about Oswego: The First Diving for a Human Body: Position of the Body: Why Persons do not Rise when Drowning: Recovers the Bodies of a Family of Six: "Such Sights": The Rescue of a Lady from a Watery Grave: The Recovery: How to Restore Persons apparently Drowned: Experience of the Lady while Drowning: The Rescue of a Man in Albany: Strange so many cannot Swim, ... 11

CHAPTER IV.

Swimming under Water: The Sturgeon: The Trade: Man Drowning: Sinking of a Boat on the Hudson Diving for the Bodies on Board: More Diving: Surrounded by Fish: Closing Business, ... 15

CHAPTER V.

Page.

The Departure: Hope: The Voyage: Evening: The Collision: The Propeller goes down with Relatives and Friends on Board: Diving to the Wreck: Passengers taken to Cleveland: The Return to the Place of the Accident: More Diving: The Result: Search for the Bodies: Different Positions of Bodies in the Water: The Bodies Found: Baggage found Rifled: Something to do, ... 17

CHAPTER VI.

The First Sight at a Marine Armor: The Offer to try it: The Scoff: The Dive: At last allowed to try the Armor: Description of the Armor: Goes down, and remains Thirty Minutes: Sea Sickness: The Time of the Second Submersion: The Desire to go the Wreck of the Erie, 72 feet below the surface: Philosophy teaches that Water would Press the Diver to Death: The Trial: The Result: The Mutual Company: The Bank in Lake Erie, ... 20

CHAPTER VII.

The Engagement with the American Express Company to explore the steamer "Atlantic:" Salt Water Divers engaged: Their Boats: Their Refusal to Dive to the Depth of the Steamer: Diving to the Wreck: Sensations: The Object of the Search not found: The Search abandoned: The Resolve, ... 24

CHAPTER VIII.

Preparation to Raise the Wedge of Gold: The Result: Other Divers claiming the Wreck: Two Divers down at a time: The Fight: Diver Lost: His Appearance: Diving in November, ... 26

CHAPTER IX.

Page.

Company for Raising the Erie: The Attempt: The Death of a Diver: How caused: His Appearance: The Erie Raised: Part of her Hull towed into Buffalo: Repairs to Boston: Construction of Improved Armor, ... 28

CHAPTER X.

Engagement with the "Boston Wrecking Co." to go to the West Indies: The Object of the Journey found: Its Appearance: Articles Found: Various Wrecks Explored: Short of Provisions: Sail to a Port on the Island of Hayti: The Appearance of Government Military Officers: The Island: Returns to Boston, . 33

CHAPTER XI.

Description of the Silver Banks: Plants, Fish, and Insects to be found there: Killing Sharks: Sharks Eating Themselves: Other Fish: The Passage through the Banks: Shipwrecks, ... 37

CHAPTER XII.

Preparations for Diving to the Steamer "Atlantic:" The Safe Found: Experience in Diving: Removes the Safe: The Last Dive to the Steamer: Symptoms of Sickness: Paralyzed: Taken to Port Dover: Partial Recovery: he Letter, ... 40

CHAPTER XIII.

Peculiarities of Different Divisions of the Earth: Hints in regard to the Water of the Lakes: Caverns in the Bottom of the Lakes: Hot Springs, ... 46

CHAPTER XIV.

Page.
How to Float on the Water: Swimming: Directions for Diving with the Armor: Precautions: Who make Good Divers: The Diving Bell: Blasting Rocks under Water, ... 48

CHAPTER XV.

Different Kinds of Apparatus for Diving: Diving with Armor not understood by writers on the Subject: Who first made the Armor serviceable for Diving in Deep Water: Harrington at the "Atlantic": Conclusion. 50

DIVING

OR

SUBMARINE EXPLORATIONS.

CHAPTER I.

The Birth Place—Early Years, how spent—Moves to Ogdensburg—Learns to swim—Removes thence to Oswego—Progress in Swimming—First sees Diving for Property.

Before entering upon that part of my life which is connected with the use of the Submarine diving; perhaps a hasty sketch of my early life, and, particularly, that connected with diving, will not be uninteresting, even, to the hasty reader. In this and a few of the succeeding chapters will be found a brief capitulation of that experience—given, I trust, in as short a space as the various events will allow.

I was born near the city of Montreal, Canada East, in the year 1826. My parents emigrated to the Province from France at quite an early period, and settled upon a small farm near that city. It was there that my early days were spent—spent as farmers' boys, as well as others, too often spend their time, neglecting to store their minds with that useful knowledge and learning, which will fit them for the duties of life, no matter what avocation or profession they may choose to follow. And, although, my profession, if I may so term my business, may seem to require little but mere physical endurance; yet, I must assure the reader that I feel very keenly my inability, to present and describe it minutely, and intelligibly. Were I able so. to do, I am quite sure I would convince the reader that there is much of science and art about submarine operations. And even with my present attempt, I hope to be able to banish from the mind of any reader that impression, if he entertains such a predilection in regard to the subject.

I remained in Canada until 1835, when my father removed to Ogdensburg, New York, where he continued his former occupation; and I remained with him, working on the new homestead. Our new farm was situated near the river St. Lawrence, and it was in the waters of this noble river that I first learned to swim. I mastered the art with more than ordinary ease; and I once practiced it to perfection; and; in another part of this little work, will be found a description of that experience, which I had tested for years. I can say with confidence, that whoever follows those rules, will be able to swim; and in case of accident requiring it, to remain upon the surface of the water for hours.

In the spring of 1840, my father again disposed of his farm, and removed to Oswego and engaged in mercantile business. In that locality I had ample opportunity to indulge my propensity for swimming by often bathing in the deep waters of Lake Ontario. I became so perfected in the art, that I could swim miles: and in the harbor at Oswego, I first began diving for lost property, and human bodies.

◆

CHAPTER II.

The First Diving for property—Success—The idea of a future employment—The resolve to adopt Submarine-Wrecking.

It was in the spring of 1841, as I was walking leisurely along the dock in Oswego, that I first saw diving for lost property. Two men were plunging to the bottom of Oswego River for a box of soap and a clock—two articles which had been stolen and thrown into the water. As the weather was fine and diving a sport in which I greatly delighted, I at once decided to try my art in the search. I divested myself of my garments, and dove for the bottom of the river. I sank about fifteen feet—half way—when I began to feel a little timid, and I instantly rose to the surface of the water. I again observed with what ease and apparent unconcern, the divers sank even to the bottom of the river; and I decided not to be out-done in my favorite sport, and I plunged down again, and swam to the bottom; and with me as I returned to the surface, I brought a bar of soap, the box having been broken.

Encouraged by this prize, though, simple, I continued diving with renewed vigor, and was soon rewarded by finding and recovering the clock; and, in doing so, my last submersion lasted one minute and a-half, a longer time than I ever remained under water before. To the spectators on the wharf it seemed two times two and one half minutes. They supposed I had strangled, and in my desperation clung to some protruding object below the surface of the water.

Elated by this success, I at once concieved the idea of following diving for lost property as a vocation; and during the same season, I recovered large quantities of freight, which had been lost in the harbor and lake about Oswego; the sale of which was so remunerative, that I resolved to follow Submarine Wrecking in the future, as a business.

CHAPTER III.

Familiarity with the Lake and Harbor about Oswego—The First Diving for a Human Body—Position of the Body—Why Persons do not rise when Drowning—Recovers the Bodies of a Family of Six—" Such Sights"—The Rescue of a Lady from a Watery Grave—The Recovery—How to restore Persons apparently drowned—Experience of the Lady while drowning—The Rescue of a Man in Albany—Strange so many cannot swim.

By the fall of 1841, I had become familiar with the bottom of Oswego river and also of that of the lake bordering Oswego, for I had recovered property in almost every locality, and had dove in many more.

And it was at this date that I was first called upon to search for a more precious freight than I had ever before, in the hasty conception and adoption of my profession, concieved of undertaking to rescue,—it was the body of a fellow being. A boy of about sixteen years, had fallen from a canal boat the day previous, and his body could not be found. I at once, on hearing of the accident, undertook the search. After diving several times, but, without success, I at last found the body. The hands were griping a stick of protruding timber at the bottom of the river.—

It was with much effort that I released their hold.

The position of this body, will account for so many persons failing to rise, after they sink beneath the surface of the water. In all cases with which I have been acquainted, this has been the sole cause of their not rising at least, three times.

In the summer of 1844, I was again called to perform a like office. I dove for the bodies of a Norwegien family of six in number, who were drowned from the capsizing of a small sail craft as she was leaving the harbor at Oswego. The roughness of the water at the time rendered it impossible to save them, or to raise the bodies; but, after a few days, I was successful in finding all the bodies of the unfortunate family. I first brought up the father and two children, whom I found partly under a projecing rock at the bottom of the river. One child was clinging around the father's neck, and the other to one of his arms. A short time after, I recovered the mother and the two remaining children—one in her arms, and the other clinging to her dress.

These two groups presented "such sights" as I never wish to behold again, and yet, as the bystanders looked upon those dead parents each with two children clinging to them; to the father the elder, and to the mother the younger children—each gazer exclaimed "they did not desert their children. The scene had that about it, which must have been a consolation even to the dead.

Early in the spring of 1845, I again dove for a body. It was that of a sailor who was struck overboard from a schooner, as she was making the port of Oswego. This was an arduous task. The water was chilly at the time, and the precise locality where he was lost was not known. I did not find it for days, although I dove for it in many places.

As I was about to leave Ogdensburg for Oswego, in the steamer "Lady of the Lake," in the latter part of August, my services were unexpectedly demanded to save a young lady from a watery grave.

At the moment the steamer was to leave her dock, a gentleman with his wife and daughter—a young lady of some sixteen years—came up wishing to take passage. The after gang plank had been taken in, and they were obliged to run to the fore-one, which they did in time for the man and his wife to pass on board; but, as the daughter was on the plank, it slipped, throwing her into the river, and she sank at once, and did not rise. The cry of "a woman over board," was raised in all parts of the ship, and along the wharf. I rushed to the spot, and, without divesting myself of clothing, plunged into the water. I went to the bottom of the river, but could not see the object of my search, and I arose to the surface empty-handed. All was now confusion. Parents intreating, all advising, but none doing. I went down again, but with no better success. All now supposed that she had been struck and killed by the revolving wheel, and had of course sunk to rise no more. I again dove, but rose with the same result. But I did not give up the search; and on going down the fifth time, I found her some distance down the current from where the boat lay, clinging to a snag at the bottom of the river. I unclasped her hold, and brought her apparently lifeless form to the surface of the water. It was at once seen that she had escaped the wheel unharmed. She had now been in the water some eight or ten minutes; but by the following treatment she was sufficiently restored to converse, in less than a half hour..

We at once removed the wet clothing, wiped the body dry, placed it in warm blankets, and rubbed it gently with warm cloths, especially her feet, armpits and stomach, and some one frequently blew into her mouth to excite breathing.*

---

* The common idea, that persons in drowning are suffocated by taking water into the lungs, instead of air, is incorrect. and the common, but dangerous practice, of placing the body head downwards to let the water run out, should never be practiced.

The real cause of death, is the exclusion of air from the lungs; by which the proper aeration of the venous blood is prevented. and, consequently, the latter circulation through the arterial system, while the pulmonary veins ceases to convey oxygenized blood to the heart. Therefore the vital punctures and heat rapidly extinguish; so that in four or five minutes after air has been cut off, life is extinct; although, life has been restored after fifteen or twenty minutes submission, and after perfect insensibility. But it was done by long and skillful exertion.

The great object in restoring persons apparently drowned is, "to restore animal heat. For this purpose wet clothes must be removed without delay, and the body, after being wiped dry, placed in a warm bed or blankets or if possible it should secure warm air baths. In either case the heat should be at first moderate, and gradually increased. Bottles of hot water should be placed at the feet and armpits, and a warming pan or heated bricks should be gently past over the body, or a gentle friction exercised with other warm substances. Meanwhile continued, though gentle attempts should be made to excite breathing artificially, such as blowing in the mouth, &c. If a machine be at hand, slight shocks of electricity should be kept up at the same time.—If there be any signs of returning life. such as sighing, and convulsive twitching, a vein may be opened. The throat may be tickled to excite a propensity to vomit and a teaspoonful of warm water administered to test the powers of swallowing. If it resist, a table spoonful of diluted wine or brandy may be given.

Even if no signs of life are discovered this treatment must be vigorously followed for three or four hours.

Signs of life was first discovered by a faint twitching under the chin, as if the stomach was iritated. In a few moments the water spouted from her mouth, and shortly after she spoke, so as to be understood.*

After the lady had so far recovered as to converse with those around, she related her sensations as she was apparently drowning. She stated, that after she first went down and a momentary horror of death, and a thought of her parents, although she was aware she could not breathe, she felt no pain whatever—that she felt very comfortably—and, as she lay there beneath the water, she saw the sun in the heavens above, and its appearance was that of a great ball of fire, but without any dazzling, or blaze, and, as consciousness gradually past away, that ball of fire grew less and less brilliant, until it finally went out, like the lingering spark of fire, on a half extinguished candle.

My second timely effort to save a fellow being from drowning, was in Albany, the ensuing season. As I was standing on the bank of the Hudson river, at that place, admiring the varied prospect around me, I observed a person fall from a canal boat into the water. I hurried to the rescue; but as I swam near the drowning man, I saw it was not prudent to come within his reach, as he was a large man and he floundered desperately, for life. I knew that something must be done, and that immediately. I awaited my opportunity and gave him a blow behind the ear which, I must say, stretched him floating, I then brought him to the boat and he was taken on board: he soon recovered.

I have given this last occurrence to show the value of knowing how to swim. Had the subject of this accident but have known how to practice the art of swiming he could have rescued himself with the greatest ease. And had I not been familiar with the art myself, he would, in all probability, have drowned.

It often appears strange to me, that such a proportion of community know nothing of the art of buoying themselves on the water—an art which requires only presence of mind to enable one to follow nature. All the dumb animals can swim, it is well known, and why? Because they simply endeavor to navigate in the water as they do upon land. If persons in the water would simply do this, they would find themselves buoyed sufficiently to lift the mouth above the surface of the water.

---

* I should here say, that the father, with a generosity, equal to his means, made me the handsome present of five hundred dollars, for my timely efforts in saving his daughter.

CHAPTER IV.

Swimming under water—The Sturgeon—The Trade—Man drowning—Sinking of a boat on the Hudson—Diving for the bodies on board—More diving—Surrounded by fish—Closing business—Farewell to Sub-marine Wrecking.

At various periods during the period of 1842 and 1843, I recovered quantities of freight sunk in the harbor at Ogdensburg; among which was sixteen tuns of pig-lead, which had been lost from a schooner in 1837, as she was endeavoring to make that port; and at this time I was so accustomed to diving that I could swim three hundred feet under water, and remain down from two to three minutes.

During this period there was a trifling occurrence which will not, perhaps, uninterest the reader. In one of my divings, as I was near the bottom, I noticed a large sturgeon very near me. He seemed quite unaware of my presence, or did not deem me worth his fishship's notice, and I thought that I would have a little sport at his expense; and I seized him by the gills. At the first dart he dragged me some hundred feet, leaving me behind in his further course, but not without a wound, for, in relinquishing my grasp, I had left half the flesh on my fingers clinging to his harsh gills. After that encounter, I never again, meddled with the larger inhabitants of the deep.

In the fall of 1844, I commenced as a machinist, with the firm of D. Talcott & Co., where I was to work winters only, as I wished to follow Submarine Wrecking, during the warm season of the year.

In the following summer I went to Ogdensburgh, where I dove to the wreck of British gun ship, which was lost during the war, in 1812. I there recovered cannon, swords, balls, muskets, and various other implements of war, mostly of little value.

The vessel had been so long down, that the spikes used in her construction had entirely rusted away, and the timbers and planks parted from each other.

On, and near this wreck, were many human bones. They were all of a yellow hue, and had every appearance of having been in the ship, and about her, as long as the vessel had lain there, and were, probably, with her when she went down. We raised two or three skulls; but, on bringing them to the air, they were found to be so much decayed, that we cast them back to their submarine grave.

About the harbor I found large quantities of freight, which had been lost from various crafts, making and leavthat harbor. I also raised several anchors and chains, which had been lost, from time to time, above Ogdensburg, among the Thousand Islands.

In the year 1847, I recovered some sixty tons of rail road and boiler iron, which had broken through the dock at Oswego, and lay in about fifteen feet of water. To add another income to my business, this season, I often went beneath the surface of the water, and corked vessels, when they leaked at the bottom, but not sufficiently to warrant taking them into dry dock.

At this time I had recovered every thing in the harbor of Oswego, worth the arduous labor of raising, and I left that town en route for New York city.

Nothing of importance occurred until I was descending the Hudson river. Near the town of Hudson, several boats were fog-bound, among which was the boat on which I was a passenger. While we were lying here, a sloop, in passing a number of canal boats which were in tow, ran into one of them, and it instantly sank in thirty-four feet of water. The accident happened about midnight, and the captain, his wife, and one hand belonging to the boat, who were in their berths at the time, went to the bottom with it.

The distance of our boat from the place of the accident rendered my assistance impossible. In the coming morning, I dove to the wreck, for the purpose of obtaining the bodies of those lost; but I found great difficulty in carrying that purpose into execution. I learned, on diving, that the three had left their berths at the time of the accident, and their bodies were in the cabin; but it was not an easy affair to obtain them even there. After trying other means, I found it necessary to remove the top of the cabin, which was easily done after I had dove and fastened a rope to the hatchway. When this was done, I found no difficulty in bringing the bodies to the surface. The faces of the drowned were quite black, and had the appearance of strangulation—an illustration of the theory expressed in note No. 1, on page 13, in this work.

I did nothing more at diving until in the spring of 1852, when I saved some sixty tons of bar iron, which was lost a few miles below Hudson, in the Hudson river. At this place, while in the water, I was surrounded by shoals of fishes, which darkened my way, and annoyed me much. The fish would dart up, and nibble at my skin, leaving marks resembling the bite of a mosquito. They even retarded my operations.

At the close of this season, I determined to abandon submarine wrecking, and return to the occupation of my early years. I therefore endeavored to convert all of my means into cash, and I accomplished it to my entire satisfaction. I found, after eleven years of toil and exposure, not only "on the seas," but "beneath the seas," I had "laid by" the sum of seven thousand dollars. With this little amount, I had decided to procure me a home in "The West," on which I hoped to spend the remainder of my life. And I saw nothing foreshadowed in the future, which would debar that realization—my golden wish.

◆

CHAPTER V.

The departure—Hope—The voyage—Evening—The collision The Propeller goes down with relatives and friends on board —Diving to the Wreck—Passengers taken to Cleveland—The return to the place of the accident—More diving—The result—Search for the bodies—Different positions of bodies in the water—The bodies found—Baggage found rifled—Something to do.

Having closed all of my business in Oswego, to my entire satisfaction; and having no further business relations in that city—on the 9th day of July, 1852, I bade farewell to friends and foes, and, with my brother, his wife, and his wifes' family, making in all ten persons, left Oswego, on the Propeller Oswego, all bound for new homes in the far-West.

We passed over Lake Ontario, through the Welland Canal, and, on the eleventh inst., were on the waters of Lake Erie, with nothing to mar our so far prosperous voyage. Our high hopes were still hightened, and with joyous hearts, we retired to rest, little dreaming of the sad disaster which almost yawned us in the face, or, how near to death were so many of that happy company whom on the evening of that night were so jocund and gay. How true it is that, "we know not when a final separation is to take place"—"at evening, or at mid-day, at cock crowing, or in the morning" —and yet I have found, that it is wise in nature that we know not.

About midnight I was aroused by a heavy shock and a sudden crash. The thought of a collision flashed across my mind, and the next instant I was at the scene. We were run into by the Steamer "America," bound for Buffalo; and our boat was filling with water. All now was confusion, and fright; women shrieking for help, children calling on their parents to save them, while others were imploring God to have mercy on them. Many of the passengers were now first steping from their state-room, and, as they did so, and beheld the sullen waters enveloping, the vessel's edge, such shrieks of horror rung upon my ears as I never, never wish to hear again. The boat went down in less than five minutes with four of our little party, and many others on board. The remaining passengers had hardly time to be taken on board of the "America," leaving behind every thing except what they had on at the moment, and many of them were in their berths at the time of the accident.—I at once dove for the loved ones of our party that had gone down with the ill fated boat. For, with my skill, hope had not entirely died in my heart. I went down three times, but each time without success. I found only one body, that of a man, but it was so entangled in the rope railing of the promenade deck that I could not release him; although in endeavoring to do so, I remained under water for such a length of time, that on my rising to the surface of the water blood gushed from my eyes, ears, lips, and from under my nails—another illustration of the theory of drowning.

Myself with the survivors of the accident, were taken to Cleveland, as we were only fifteen miles from that part. In the morning, myself, brother and friends, returned to the place of the collision, and I again dove to the wreck. I discovered that the cabin had been taken away during the night, together with the baggage and other movables aboard the boat. "At one fell swoop, I had lost friends and all my worldly gear. The latter loss was trifling—trifling, because hope that jewel which we all possess, still pointed to the future. And there is only one foe that can rob us of it; and that is the grave. No matter whether we see the coffin lowered into the silent grave, and hear the covering earth wake the dull requiem, or see the beloved sink beneath the wave and rise no more. When we left that sad spot unmarked in the waters of Lake Erie, we knew and felt no less robbed of hope than if it were an earthly grave. There was no hope—well may it be said that the victory of the grave is hope.

To say we felt disheartened is not, I think, to acknowledge that we were less than men. But for myself, I did not despair. Their was a future and to it I bent my "minds eye," and not to the past.

For fourteen days I watched the shore of Lake Erie, dayly traveling for miles that extent bordering the vicinity of the wreck, waiting for the bodies of those near and dear ones, that were lost on that woeful night; for my experience had taught me, that they would rise to the surface from their watery beds, and most probably wash ashore.

I had seen bodies beneath the water in all stages of decomposition and those most likely would undergo the same changes of position.

Although the human body sinks readily when the breath is first exhausted, it assumes another position after it begins to decompose into its elements. The gases which it contains gradually expand the body, and becoming lighter than the water, it begins to rise. The limbs and especially the legs do not expand as much in proportion, as the trunk and therefore, inclines the body in the water, until it assumes an almost vertical position. It is a sight such as timid souls would quake to look upon—to see a corpse standing upright deep beneath the water's surface, its slimy visage swollen, glassy eyes, and rocking to and fro, by every tiny wave that moved the water. Yet of such are some of the spectres of the "vasty deep."

During the space of my watch on the windy beach, I was rewarded by finding all the bodies of those for whom I searched, and sent them to their relatives, or had them decently interred. It was evident by the appearance of the bodies that they had undergone the changes which I have described.

Having performed these last rites to the dead, I at once looked around me for an opportunity to earn a subsistance, for my trunk had been found in the mean time, rifled of my little fortune in gold, and even my clothes. I stood in the world empty handed—I was as it were about starting the world anew. But I had willing hands, a bold heart, and knew there was something for them to do, who were ready and not dainty in doing it. With me "there was no such word as fail."

CHAPTER VI.

The First Sight at a Marine Armor—The Offer to try it—The Scoff—The Dive—At last allowed to try the Armor—Description of the Armor—Goes down, and remains Thirty Minutes—Sea-sickness—The Time of the Second Submersion—The desire to go to the Wreck of the Erie, 72 feet below the surface—Philosophy teaches that the Water would press the Diver to death—The Trial—The Result—The Mutual Company—Stealings—The Bank in Lake Erie.

It was while I was instituting the search for the bodies of my relatives and friends along the shore of Lake Erie, that I first saw scientific diving. A party of divers and wreckers, who used submarine armor, were exploring the wreck of the steamer "Griffith," which was burned in the summer of 1850, and sunk near the place of the disaster to the "Oswego." The wreck lay in about fifteen feet of water. The divers went down, and remained from twenty to thirty minutes. After witnessing the divers descend several times, I expressed my desire to try the armor; but I was only scoffed for my boldness.

I had often heard of *submarine armor*, and, when following wrecking, had thought seriously of procuring one; and, as the "seas" had robbed me, I did not know but I should again rob the "seas." This opportunity to test the value of such an apparatus, thought I, must not pass without a trial, if it can possibly be obtained. But, on my renewed solicitation, I was gravely informed by those *experienced divers*, as they termed themselves, that none but those who had the greatest skill were ever allowed to use the armor, and it would be hazarding my life to undertake it. I replied, "My sins upon my head," and dove down to the wreck, and remained under water almost three minutes. This satisfied those "old divers," that I knew something of diving, at least, without armor, and, with some more hesitation, they allowed me to encase myself in the strange habiliment.

This armor was constructed of copper and India rubber. That part constructed of copper was to protect the head, and termed the helmet. It was of oval form, quite large in comparison with the head, and had a window in front, and one on each side, for the diver to see through. The rubber covered all the remainder of the body, except the hands, and its dimensions were sufficient to admit an ordinary sized man, with three suits of woolen clothes, which amount was necessary to keep the body warm while under water. At the top of the helmet was attached the pipe, through which air from the surface, by means of an air-pump, was forced into the armor, keeping it constantly inflated. At the waist of the helmet in front was the escape pipe, for letting off the impure air into the water.* There was also in the helmet a valve, which, *in case of leakage of the supply pipe*, would instantly close and prevent the air from passing out; and another on the end of the escape pipe, which the water would instantly close on rushing into the pipe.

I dove for the wreck, and, on my first submersion, I had far stranger sensations than ever before experienced while under water. It resembled that *timidity* which attacked me when first I dove for the lost clock and soap. But in that case I was master of my own ability, and if I wished to emerge, I could instantly return to the surface. Here it was not so. To me the armor was a new habitation; and the thought that I might suffocate—that my signals would fail to be understood, or, if they were, would they draw me to the surface before I should die, awoke feelings which I cannot describe; nevertheless, I ventured down to the wreck. To add to my discomfiture, I was attacked with symptoms of sea-sickness, which were increased by every movement of the water. Notwithstanding, I was determined to show the *old divers* that I could remain down as long as they, for, on emerging, I found I had been down about thirty minutes, which was equal to their stoutest boasts. The instant that I began to ascend in the water, my sickness increased, and by the time I was on the boat, I felt as disagreeable as ever a "land lubber" in a gale at sea; and they had no more than time to remove the glass window of the helmet, before I cast up the undigested refuse of my breakfast, together with the blackest bitter bile. It was my stomach, and not the water, that was to blame. I have often seen persons sea-sick after they had been on the water a long time, or often, without having any symptoms of the complaint. This arises from the state of the stomach. Had I at this time been where there was a rough sea, I should have been troubled with the sickness, although I had been so familiar with sailing.* It was all soon over, and I felt quite myself again.

---

* It may appear strange at the first thought, that air would pass out of the helmet into the water, while the water would not run in; but the fact is easily explained. Air is forced into the armor, until the pressure therefrom is greater than that of the water, and consequently displaces the water, instead of the water displacing the air.

It was by this time noon, but I took no dinner, and only rested myself for another dive, while the rest of our party refreshed themselves; and, after repairing our air-pump, which we found defective, about half-past one o'clock, I sank again to the wreck, and remained down until seven o'clock—about six hours. At this date the time was unprecedented in the annals of diving.

We raised some parts of the engine of the steamer, but besides this we found very little of value; and, after two weeks spent here, I proposed to our company to remove to the wreck of the steamer "Erie, burnt August 9th, 1841. In this enterprise I was unanimously opposed by the company. Some of the most learned, scientifically, informed me that philosophy taught, and that any man of learning would tell me, that a person could not live in such a depth of water as that of the Erie—that it would press him to death instantly.

My experience in diving had taught me differently, and I was not likely to be changed by what information I derived from that particular source.† I still advocated a search for that wreck, stating my willingness to go down to it. By this assurance, I was successful in changing the minds of the company.

We had now formed ourselves into a mutual company, with the understanding that the spoils should be divided pro-rata. Thus, every one was interested in the welfare of the company. The principal diving was done by myself; and if I consented to do that part, however arduous, the rest of the company could not seriously refuse to follow my inclination.

We found the hull in seventy-one feet of water, yet I found but little difficulty in reaching the wreck. On going down I struck on the bow, where my first attempt was rewarded by five dollars in silver, which I picked up almost on the very spot where I first struck. Here again I was beset with a myriad of fishes, which came around me in such numbers as to darken the water, and retard my work. But the "Erie" proved a more wealthy mine to us than the

---

*** Sea-sickness may be prevented by taking a glass of warm weak brandy and water, to which 15 or 20 drops of laudanum—or still better, 1 or 2 drops of creosote—have been added, previous to going to sea in a storm; but an horizontal position is the most sure preventive.**

† These men did not think air could be pumped into the armor until it overcame the pressure of the water, at three times the distance of the Erie, which was 72 feet below the surface.

"Griffith." I sent to the surface large sums of money, which *strange* to record, invariably proved to me less than when under water. I called the attention of the company to this discrepancy, but was politely informed that it was "very deceiving down there, you know." Perglich, a land shark belonging to our company, and the very one who made the above speech, came to me privately, and saying, "I was about right on that point," and if I would agree to hide a part of the treasure below, he would come with me some night, and help secure the same, and we would divide the booty among ourselves. I gave a feigned consent, and kept my eyes open, and ears awake. But a few nights after, I heard this *pretended friendly thief* relating to a comrade his plans, and said he, "I will hide it thus, and so. You carry off the booty when I place it there, and I will make it appear it has been stolen. You shall have half." I was to give him a third. Another thief in our company, thought I, there will be three! To hazard my life, and then to be robbed by those who were to share in all I found, was a provocation more than I had virtue to take, and still live in reverence of the golden rule; and I did not unto others as I would they should do unto me, but I did unto others as they had done unto me. I sent up only a part of the money, and stored the rest away for some future emergency. I also found what to me at that moment seemed equal to the fortune I had just lost. It was a mass of metal weighing about seventy pounds, as if five or six thousand dollars in gold had melted, and run into one solid mass. This I cast into my submarine vault, and locked the secret in my heart.

Some of my party complained because I did not send up more money, when at one time I had stated I should find so much. I replied, "It is very deceiving down there, you know." I could see in the water very well a short distance.

Many and often were the times during the coming fall and winter, that I boasted of my *Bank* in Lake Erie. I thought myself rich, and like a man with a successful ticket in "the lottery," I was in high spirits. That massive wedge of gold will be mine, and I again laughed at the future.

CHAPTER VII.

The Engagement with the American Express Company to explore the steamer "Atlantic"—Salt Water Divers engaged—Their Boats—Their Refusal to Dive to the depth of the Steamer—Diving to the Wreck—Sensations—The Object of the Search not found—The Search abandoned—The Resolve.

My various exploits in diving had been made known to the public through the columns of newspapers in every part of our country; and my movements on Lake Erie were noticed more particularly by the press than they otherwise might have been. Various parties addressed me at this time, for the purpose of obtaining my services in securing lost property. Among these were Mr. Wells, and a gentleman from New-York—M. Malefort—on account of the American Express Company, for the purpose of raising the safe belonging to that company, containing thirty-six thousand dollars, which was on board the steamer "Atlantic," sunk off Long Point on the 19th of August of that year—1852—by coming into collision with the propeller "Ogdensburg."

The gentlemen had also made arrangements with two submarine operators from New York city, who had been employed in diving in the ocean, or *salt water*, as they termed it.

While we were making preparations in Buffalo, and also, while on our way to the place of wreck, these persons were constantly boasting of their great exploits; that they had gone down in one hundred and fifty, and two hundred feet of water—often; and remained down—how long I will not attempt to say. The termed me "the fresh water diver;" that I played in shallow water, and like a boy who could not swim, dared not venture where it was too deep. Thus I was annoyed by their boasting, at work, at meals, and at rest. I longed for the moment to arrive when one of us must commence the arduous task. Then they could make their great dives over again, for I had my suspicion, that, like the great *jumper* in the fable, they were in a foreign country when they made these unprecedented dives.

On ariving at the place of the accident, we found that the steamer lay in *one hundred and sixty-two feet of water;* and my suspicions were verified; for both of these "salts" positively refused to undertake to go down to such a depth; and we had either to return to Buffalo, like a bashful lover from the door of his idol, or myself alone must undertake to make the dive. I resolved at once to hazard the trial, and to reach the wreck if it was a possible thing to do so.

I had previously tested the armor owned by these New York divers, and found it far superior to the one I had been using, and I selected it in which to make this trial.

Every thing having been got in readiness, I commenced diving for the wreck, and sank on my first trial one hundred and five feet—deeper than I ever before had been in water. The pumps failing to supply the armor with air sufficient to prevent the water from pressing my body, I at once arose to the surface. Having arranged that difficulty, I again submerged, and sank to the depth of one hundred and twenty feet, when the air pipe commenced leaking, and I was again compelled to emerge. On repairing this difficulty, I went down again, and was successful in reaching one of the smoke-pipes of the steamer, my body passing into it, while one of my arms dropped outside the pipe, the top striking my armpit. To extricate myself from this position, it was necessary that I should be drawn up a little distance, and I again arose to the surface. I immediately went down again, and this time struck upon the walking beam, and by feeling my way still down, as I was in perfect darkness, I stood upon the deck of that ill-fated steamer, one hundred and fifty-two feet below the surface of Lake Erie. The air pipe again burst, and I had to be instantly drawn up. This accident detained us several days, as we were obliged to return to Buffalo in order to get it repaired.

Where now were the "*salt sea divers?*" where their gigantic boasts of exploring the "vasty deep" two hundred feet below the surface? Their cowardice proved those boasts a conglomeration of an old "salts'" yarns; and, on our return to Buffalo, these crest-fallen fellows were as silent as a couple of day-overtaken owls.

On our return to the place of the steamer, I went down to the wreck several times. I found the boat entirely clean, apparently, as if she were at her dock.

In diving in other places, I had found it necessary to incline the body forward at an angle of about twenty-five degrees, before I could make much progress in the water; but here, even in this position, I found great difficulty in moving; the water was so compressed; and with the diminutive air-pipe which we used, it was next to impossible to keep the armor inflated below the waist, and often it rose as high as the chest. The pressure was immense. The rush of blood to the head caused sparks of various hues to flash before my eyes, and I had a constant tendency to fall asleep, although the pressure on my limbs was enough to crush them under ordinary circumstances. These circumstances rendered it prudent for me to rise, at least as often as every thirty minutes, which greatly retarded our progress; and, as I had not discovered the object of our search, the gentlemen who employed me at length became discouraged, and abandoned the wreck on the part of the company, and with it ended my operations for 1852. But I was not to abandon the search for the safe. I knew it must be aboard of the lost steamer, and, if so, it could be obtained. I resolved at some future time to again try to raise it, after it should have become abandoned, in accordance with the statute in such case made and provided.

CHAPTER VIII.

Preparation to raise the Wedge of Gold—The result—Other Divers claiming the Wreck—Two Divers down at a time—The Fight—Diver Lost—His appearance—Diving in November.

The winter of 1852–3 at length broke away, and as there was a prospect of resuming navigation on the lakes, I began to make preparation for drawing on my bank in Lake Erie, of which I had so often boasted. No one with a deposit in one of our *free* banks, could feel surer of his checks being paid, than I did of having mine when I presented my face at the counter of that bank—the hull of the Erie.

With the first favorable weather, I set sail for the scene of the wreck, which we soon found. On going down, I found the massive chunk just where I had placed it the previous year. I at once rose with it to the surface; and you can have but a feeble conception of my mortification and chagrin, to find that, after all my high anticipations, I possessed a portion of the bell which once belonged to that ill-fated steamer.

I secured, however, about seven hundred dollars, mostly in five franc pieces—a better per centage than we often get from many a bank on *terra firma*. But I was soon disturbed by others, who pretended to have a claim on the same institution. A party of divers, who were with me at this wreck the year previous, hearing that I had taken quiet possession of it, came with the determination of dispossessing me. They cut away my buoys, and threatened to drown me if they found me down to the wreck. One of these divers, a bragadocio of a fellow, was particularly boisterous, with this threat, "If he met me down at the wreck, I never should come up alive!" I gave him an immediate opportunity to carry his threat into execution, by going down to the wreck; for I had possession of that part of it where I had reason to believe that the greater portion of the money was to be found, and I was anxious to maintain it. He immediately followed my example, but struck at such a distance from me that we were both unaware of the precise locality of the other. I kept good care that he did not intrude on that part of my domain in which the treasury was to be found. At last I saw a dim form in the water moving toward me. I made at him with all my power, my uplifted bar ready to strike, and the spectre at once ascended from my view. The boaster had signalled, and been drawn up. But he was not to give the battle up thus, for I learned by a signal from above that he was again descending. I stood on my guard, and the fellow came down directly over my head. The instant he came within reaching distance, a punch from my crowbar caused a retrogression in his movement, and he soon reached the surface, contented, having fought as much as he thought would be prudent under water. On my emerging, I was threatened with a prosecutisn for assault and battery. The thing, however, never occurred; and, after working in this way about a month, I returned to Buffalo, and assisted Mr. Bishop in constructing a derrick, for the purpose of raising the steamer "Atlantic," which was afterwards lost on its way to the location of the wreck of the "Erie," where it was first to be tested.

During this time the other party, whom we had left at work at the Erie, lost one of their divers by suffocation, while down to the wreck, by neglecting to force a sufficient quantity of pure air into the armor, and not having a sufficient sized pipe for the impure air to escape. I recovered the body a short time after the accident. We found the head so swollen that it was impossible to remove the helmet, and of a purple hue as low as the top of the chest.

The remainder of the body was white as unstained snow, the water having forced all the blood in the system to the head.

Late in the fall of this season, I went to the wreck of the propeller "City of Oswego,' where I obtained freight of various kinds, worth some twenty-five hundred dollars, although exposed to the greatest hardship at the time. It was in the month of November, and the water had become cold, besides being very rough. I was obliged to work whole days by feeling my way, for the water had become so muddy that it was impossible to see.

With my operations there ended my labors for 1853; and never more willingly did I bid adieu (for a winter's rest) to marine wrecking.

CHAPTER IX.

Company for raising the Erie—The attempt—The death of a diver—How caused—His appearance—The Erie raised—Part of her Hull towed into Buffalo—Repairs to Boston—Construction of improved armor.

The spring of 1854 had now arrived, and I commenced business by forming a partnership with Messrs. Wells & Gowen, of Boston, Mr. Tope, the celebrated English diver, and myself, went to the location of the Steamer Erie, with the intention of raising her hull. We succeeded in getting chains under her bow and stern, and under the cylinder, securing the chains above by means of a buoy. We then returned to Buffalo and erected derricks for raising her to the surface. During the construction of this apparatus for raising the "Erie," Mr. Tope wished to test a new armor which he had constructed on principles different from that of the old. It consisted in having the tube for the escape of foul air extended to the surface of the water. In company with three others he started from the mouth of Cattaraugus Creek, in a small vessel, and selecting that locality where the water was about forty-five feet, Mr. Tope went down some fifteen or twenty feet, each time signaling to be drawn up, and co[illegible]ining that the foul air did not escape fast enough to allow free breathing. Previous to descending the third time he removed a spring which he had attached to a valve on the escape pipe of his new armor, to prevent too great an escape of air; and observed to the man holding the signal line, to answer the slightest signs of a message, as he should signal the moment he reached the bottom. He then entered the water and sank some forty feet, when those above thought that he felt unusually heavy. The signal line was at once worked to ascertain if anything was wrong; but receiving no answer, they at once drew him to the surface, and on opening the armor, to their horror, found him quite dead; although, he had been down but about one minute. The corpse presented such a dreadful spectacle; blood was oozing from the eyes, nose, and mouth. Detaching the spring from the escape pipe had allowed the escape of air to equal the amount pumped into the armor, and consequently did not inflate it in the least, and the pressure of water forced all the blood in the system to the head, bursting blood vessels and causing instant death.— Although he had not been submerged one minute; on opening the armor we found the head very badly swollen, the face and neck so filled with blood as to resemble liver; while the remainder of the body was as white as unclouded marble. There was no resemblance to a countenance whatever about the face "where eyes did once inhabit," were merely an indented streak, and the cheeks were level with the nose, I have seen many a corpse, but this was more revolting than any I ever beheld, except that of the poor diver lost at the wreck of the Erie; but from the time which that had been in the water, the powerful effects of the pressure was not so visible.

The reader may think there is a discrepancy in my different chapters, when it is stated, that I have dove to forty-two feet in one, and that the water has such an effect upon the body in another. The reader will perceive that, in one case the body is incased in water-proof covering, and in the other unprotected from the water. In the latter case the water which is admitted into the system through the numberless pores counteracts the pressure of the water from without, and the two equalizing each-other the body does not feel the weight; in the former case there is tuns of water on every side of the body, which it has to support. Hence the immense pressure. *

---

* The pressure of water 30 feet below the surface, is equal to 7 pounds to the square inch, hence there must have been at least ten tons compressing the body of Mr. Tope,

The pressure of the water upon the body during the two first trials of Mr. Tope, must have caused a slight rush of blood to the head, the result of which, would have been dizziness. It seems, he imagined that it was the result of foul air in the armor, and hence his insisting upon descending again with the spring detached from the valve, which he stated would allow a free current of air to pass in and out of the armor; but the reflection of a moment upon the philosophy of air will convince the reader, that removing the spring was the only cause of the dreadful accident. The apparatus used by the victim upon this occasion, was in perfect working order, and made upon all the improved principles then discovered, and the deceased was a diver of five years experience, the most of which time was spent operating in the ocean. He acted upon his own knowledge of the art, and there was no other party to censure.

I have often experienced the sensations while in the water, that these two divers who lost their life, stated they felt on diving immediately preceeding their fatal submersion; but in such moments I immediately arose to the surface, and remained up until all such feelings had left me.

On going to the wreck of the Erie, again, we raised it some fifteen feet, when the cylinder broke away and sunk to the bottom, we again made fast to it, and commenced raising again when the hull broke about forty feet from the bow. We were successful in holding the smaller portion, which we towed to Cattaraugus Creek, where we hoped to find smoother water. When off the harbor at Cattaraugus, I came very near loosing my life, while down to the fragment we had in tow. In some way the signal line, and air pipe became entangled in the purchases lowered to raise the wreck. I could not make my signal understood above. There I was, chained down as it were in some forty feet of water, and to add to my peril it was sun-set and fast growing dark. Death seemed to stare me in the face. But I did not loose the presence of mind which is of all importance to the diver. I put forth every nerve to extricate me from my fettered situation. By great effort I climbed up about six feet, where I cut my signal line, thinking it was clear above, but I found I was mistaken. I made it fast to my wrist, and examined the head-line, (the line by which the diver is drawn up), which I also found entangled, but by cutting it I was enabled to get it free; and I fastened it to my body. I then examined the air-pipe, which I found like the signal line, was entangled in such a manner as to make it impossible to extricate it. To cut this, I knew would be death unless I was instantly drawn up. I again examined the head-line—that I was sure was free. Something I knew must be done at once. I was nearly exhausted from toil, in endeavoring to release myself, and the anxiety attending my situation. I began to feel sleepy, and with that symptom the diver knows that he must instantly be drawn up.—I was now free except the entanglement of the air-pipe, and I resolved to sever that. I gave signals by means of the signal line, a jerk from which, always was understood to raise. I waited until I was drawn up as far as I could be, at that instant I with one slash, cut the air pipe, and in a moment was on the surface. The reader will at once agree with me, that my effort alone saved me from a watery grave. Had I been so much frightened that I could not work or have sent up the signs of distress to those above in season, I might have lost my life.

Not finding a suitable haven at Cattaraugus we towed the prize across the lake to Point Abino, where we raised it to the surface and secured what was valuable about it, which amounted to a trifling sum, we then cast off the fragment and it sank in about thirty feet of water. We returned for the remainder of the hull which we were successful in raising after much effort. This piece alone weighed about five hundred tons. We were unable to procure sufficiently strong fastening to raise such a tremendous weight, and were obliged to tow it to Point Abino, where we succeeded in raising it to the surface and brought it into Buffalo on the tenth of August, at which time I disposed of my interest to Messrs. Wells & Gowen, and repaired to Boston, Massachusetts, where during the coming winter I manufactured two armors on an improved plan, with the intention of diving for the safe of the American Express Company, which went down with the Steamer "Atlantic," as it would become the next season, free to any person who should recover it. The three years allowed by law to the proprietors to secure the property, having at that time expired. And true to my resolve, at the time I was requested to abandon the search by the proprietors, I intended to be prepared for the earliest opportunity to legally secure so valuable a booty.

My experience with the common armor, described in a previous chapter, convinced me that there could be made several improvements in its construction. The escape pipe seemed to me to be attached too low. The air after being breathed or remaining in the armor, for a little time, became warm, and consequently lighter, and arose to the upper part of the armor while the pure cold air from the surface, being heavier, sank to the bottom. The consequence was, that the pure air was not breathed until it became impure, while the impure air was breathed over several times.

Another difficulty was the frequent failure of the air to keep the armor so inflated as to prevent the water from compressing the lungs. And I found the whole armor far too light for what it was intended, or at least to dive as deep as even the wreck of the "Erie," much less that of the "Atlantic."

The two armors constructed during this winter were with a view of obviating the difficulty, by attaching the escape pipe at the back part near the top of the head, while the supply pipe was in front, near the pit of the stomach, and a heavy breastplate covered the body in front and extended as low as the waist. Added to this I had a bag of shot around my neck which weighed about thirty pounds, another around the waist that weighed some ninety pounds, and the shoes weighed about twenty pounds each, making the weight of the armor all together some one hundred and fifty to one hundred and seventy-five pounds.

I tested this new armor the first opportunity and found it to work far superior to the old one in every respect. It relieved that predisposition to sea-sickness, experienced in the old armor and one could move about under water far more easily. *

---

* The reader will remember that the weight of the water was such that the diver with the old armor had a constant tendency to rise, and in moving, the weight was not sufficient to easily displace the water.

CHAPTER X.

Engagement with the "Boston Wrecking Co." to go to the West Indies—The Object of the Journey found—Its Appearance—Articles found—Various Wrecks explored—Short of Provisions—Sail to a Port on the Island of Hayti—The Appearance of Government Military Officers—The Island—Returns to Boston.

After testing my new armor, it was my intention to repair to Buffalo, and make arrangements for obtaining the safe on the sunken steamer "Atlantic," when my services were engaged by the "Boston Wrecking Company" to go to the West India Islands, for the purpose of exploring the wreck of the British man-of-war "Sovereign," which was lost on the Silver Banks as long ago as 1773.

These Banks are seventy-five miles east of Turk's Island, and north of the Island of Hayti. The frigate, when she sunk, was on her way to the West Indies, and had on board eighteen tons of Spanish milled dollars, intended for paying the British soldiers stationed there.

We found the locality of the wreck, but there was not a vestige of her wood-work remaining, for it had long since been destroyed by worms. The only indications of the wreck were her cannon, balls, and various other implements of war, which were strewn around the place. They lay in from ten to twenty feet of water, to which place the vessel had drifted before being destroyed.

On going down the first time, I found one Spanish milled dollar. It was so imbedded in the coral as to require considerable effort to extricate it. The action of the water had so effaced it that the pillars could scarcely be seen; but, after heating, we found the date to be 1772. We also found some silver plate, used by the officers, and belonging to the ship. It bore the inscription "Frigate." We were not successful in procuring anything of value, the coral having grown over the silver to such a depth that it could not be got at without submarine blasting. The gentleman sent out with us by the Company failing to make his batteries work, we were obliged to abandon the place. Every spot where the silver lay could be distinctly recognized, as the coral over it was of a dark hue, having been stained by the decomposition of the silver.

Among other trifling objects which I picked up about the place was a leaden candlestick, in which was a piece of sperm candle, apparently as fresh as if just made. But the cannon, all of which were very large, had become so soft that they could easily be cut with a common pocket knife; and upon breaking the outside crust, they would emit a gaseous substance, which made the water sparkle around like champagne. Stacks of powder stood around, the kegs that formerly contained it having entirely disappeared, nothing remaining but the copper hoops. On raising one, we found it as hard as slate stone, and, on being dried, it burned like charcoal. And there, too, were the remains of those who once manned that proud ship, buried in the beds of coral. The last mark of their resting place almost obliterated.

The wreck which we next explored was that of the "Alabama," lost in 1832, while on her way to New York city. There, as in the case of the "Sovereign," worms had destroyed all the wood about the ship, except a small bit of a wooden pump, which contained in it a brass box. This had so saturated the wood with verdigris, that the worms did not devour it. By the dead worms which were around the remnant of the pump, I concluded it was death for them to taste it. This fact convinced me that, if the bottoms of ships were well saturated with paint, the basis of which was copper, it would save the immense amount which is now spent in covering their bottoms with sheet copper.

We raised several iron screws and chains which once belonged to the ship, but they were almost entirely destroyed by the water. The chains were originally two inch, but they crumbled on exposure to the atmosphere, leaving no more than one-eighth of an inch of sound iron. We also obtained some steel, lead, and sheet tin. These articles were damaged but very little. The tin, after removing the outside sheets, we found as bright as ever; the lead was uninjured, and the steel bore feeble marks of decay.

The next wreck to which our attention was called was that of an unknown ship, which must have been lost many years. There was not a mark to be found whereby we could learn the name of the vessel, of which those dim remains marked the place of the wreck. Here we obtained some crockery and other wares belonging to the ship, and almost the only marks of where the wreck decayed.

On diving to another wreck near by, we obtained a quantity of porcelain ware, and quicksilver, which, as it lay on the bottom of the ocean, was very brilliant when the sun shone upon it. There must have been a large quantity of it on board the vessel, for it filled the crevices in the coral in every direction. Here we found some champagne bottles, with imprint, and dated 1770, in the glass, which gives a faint idea of the date when this vessel rode the "seas." We also found some crockery at the place of this wreck, which at that time had been made more than two hundred years; and the date of cannon, which we found here, showed them to have been manufactured one hundred and thirty years ago. These we could see from the surface of the water, sixty feet beneath, lying among the pillars of coral.

We now found that we were getting short of provisions, and we left one of our vessels on the Banks, and with the other went into a port on the Island of Hayti, eighteen miles to the eastward of Port au Platte. We anchored just outside of the harbor, and went a-shore in small boats. The moment we landed, we were surrounded by such a band of military ragamuffins as few ever beheld—all as black as the absence of light, and with countenances that would disgrace the ape, while their bodies were caparisoned, as it were, with remnants of the costume of a fantastic training. Each had some weapon. Some had guns, the barrrels of which were six, and the breeches three feet in length; others with unwieldy swords, four to five feet long, the sheaths attached to their bodies by tow strings instead of belts. Apparently, there was scarcely two with weapons alike. As for their dress, it appeared that the whole company had divided three or four various military suits among them; for one had the legs of a pair of pants, another pants without the legs; one a coat without sleeves, another sleeves without a coat; one with a bear-skin cap two feet high, and another with its lining; one barefooted, another with shoes, the toes protruding. Each seemed to have on all the clothes which he possessed, but I thought it doubtful if each rightfully possessed the clothes he had on. This fantastic crowd, without the least discipline, devoid of decency, and more ignorant than an American slave, we found, through our interpreter, were officers of the government, come to search our vessel, to learn if we were pirates, or in the slave trade. They had no boats to proceed to our vessels, which they mistrusted were slavers, and we kindly volunteered to take them aboard, and enable them to discharge their duty. They had, however, a far dearer object in view, and in their going through the ship, I saw one of these officers clandestinely grab part of a ham and several biscuits, and store them in his two-feet bear-skin, and walk off as straight as a corporal in the British army. This trick convinced me that pride alone would not make a soldier wear a bear-skin cap in the tropics. As he was about to step off the vessel, I lifted the cap from his head, when down came the stolen property on the deck. This was a limberer to the poor fellow, for he had not even courage enough to resent the joke.

Here, thought I, on this island so lovely, where all nature vies to excel in beauty—where the landscape is the most varied, the soil the richest, the products the choicest, and the climate the mildest—is such degradation! What a field is here for the free, ambitious black man of the North! Here he may live where he can feel that no man is by *law* his superior. If he wishes to travel the road on which the inns of office are situated, surely men so much superior in intelligence would be welcome guests. Has he the conception of a new government,* which will be superior to the United States? Here is a province where those principles may be tested. If we like not the government which we have no voice in making, let us leave that government, and fly to one in which we can have a voice, instead of waiting for the enemy to grant the oppressed that voice. For the industrious, intelligent black man, there is a home awaiting him on that fertile island.

The next day we again took these *officers of the government* aboard our ships, when I gave them a specimen of submarine diving. On my emerging, they fell on their knees around me in reverence, for they thought I must possess powers more than human, to remain under water for such a length of time, having dove to the depth of 158 feet, equal to 176 feet in fresh water.

We were at first astonished at their—what we thought—enormous price for the most trifling article, but soon learned that their dollar was equal to but two cents of our currency. We obtained such tropical fruit as could be had, but no meats.

We learned that a party of sailors had been there but a few days before, and paid for supplies in spurious money—a thing that could be easily done, for their paper money resembled that with which an inferior tobacco is put up in this country. They pretended to be very anxious to discover some on board of our ships, for they ran their long swords into pork barrels, sacks, and every thing else which they possibly could.

---

* Some black men at the North go for opposing and breaking this Union of the United States, if the South will not abolish slavery.

Returning to the Banks, we prospected a short time longer; but not finding anything of value, and the ocean becoming rough, we did not deem it prudent to remain longer on that dangerous sea, and we set sail for Boston, arriving there on the 18th of July, having been gone about four months.

CHAPTER XI.

Description of the Silver Banks—Plants, Fish, and Insects, to be found there—Killing Sharks—Sharks eating themselves —Other Fish—The Passage through the Banks—Shipwrecks.

The Banks of Coral on which my divings narrated in the previous chapter, were made are about forty miles in length, and from ten to twenty in breadth.

On this bank of coral is presented to the diver one of the most beautiful and sublime scenes the eye ever beheld. The water varies from ten to one hundred feet in depth, and is so clear that the diver can see from two to three hundred feet, when submerged, with little obstruction to the sight.

The bottom of the Ocean in many places on these banks, is as smooth as a marble floor; in others it is studded with coral columns, from ten to one hundred feet in hight, and from one to eight feet in diameter. The tops of those more lofty, supporting a myriad of pyramidal pendants, each forming a myriad more; giving the reality to the imaginary abode of some water nymph. In other places, the pendants form arch after arch, and as the diver stands on the bottom of the Ocean, and gazes through those lofty winding avenues he feels that they fill him with as sacred an awe, as if he were in some old Cathedral, which had long been buried beneath "old oceans' wave." Here and there, the coral extends even to the surface of the water, as if those loftier columns were towers belonging to those stately temples now in ruins.

There were countless varieties of diminutive trees, shrubs, and plants in every crevice of the coral, where the water had deposited the least earth. They were all of a faint hue, owing to the pale light they received, although of every shade and entirely different from plants I am familiar with, that vegetate upon dry land. One in particular, attracted my attention; it resembled a sea-fan of immense size, of varigated colors, and of the most brilliant hue.

The fish which inhabited those Silver Banks, I found as different in kind, as the scenery was varied. They were of all forms, colors, and sizes—from the symetrical goby, to the globe-like sun fish; from those of the dullest hue, to the changable dolphin; from the spots of the leopard, to the hues of the sun-beam; from the harmless minnow, to the voracious shark. Some had heads like squirrels, others like cats, and dogs; one of small size resembled a bull terrier. Some with short blunt noses, others with bills protruding feet beyond their heads. Some darted through the water like meteors, while others could scarcely be seen to move.

To enumerate and explain all the various kinds of fish that I beheld while diving on these Banks, would, were I enough of a naturalist so to do, require more space than my limits wlil allow, for I am convinced that most of the kinds of fish which inhabit the Tropical Seas, can be found there. The sun-fish, saw-fish, star-fish, dolphin, white shark, ground shark, blue or shovel-nose sharks, were often seen. There were also fish which resembled plants and remained as fixed in their position as a shrub. The only power they possessed was to open and shut when in danger. Some of them resembled the rose in full bloom, and of all hues. There were ribbon-fish, from four or five inches to three feet, in length. Their eyes are very large, and protrude like those of the frog. Another fish was spotted like the leopard; from three to ten feet long. They build houses like the beaver, in which they spawn, and the male or female watches the ova until it hatches. I saw many specimens of the green turtle some five feet long, and, I should think, would weigh some four to five hundred pounds.

In diving here, we were often surrounded by sharks. They would swim cautiously towards me, as if to ascertain what I was, and I found it necessary to wear hoops of iron, for just the opposite purpose, of that for which ladies wear them at the present time. It was to protect me from sharks, not attract them.

These hoops were only necessary while ascending or decending, as no danger was apprehended from them except while in motion. The shovel nose shark is a most terrible and powerful enemy to encounter. Its jaws are furnished with three rows of very strong sharp teeth, almost transparent, the upper and under sets when closed, forming nearly a solid mass of bone; so accurately do they fit each other and of such tremendous power that one we caught snapped off a white ash oar so suddenly, that I came to the conclusion that one of my limbs caught in the same situation, would be of little service to me in the future.

We were often obliged to defend ourselves from this ravenous fish with our pikes—an instrument with two lances—the one straight, and the other bent, to about a right angle to the other. As they came near me I would strike them beneath with this instrument, the hook penetrating their bellies, and as they wheeled to swim away it would often rip them half their length, and their inwards droped out into the water; as they fell, this ravenous fish would turn and devour its own offal. The blood staining the water would attract others of the same species to the place; and these voracious monsters would at once devour their wounded comrade.

Had the shark darted at me as he often does, to secure his prey, resistance to his force would have been impossible, but he seemed to doubt if the object was eatable or not. This gave me an opportunity to use my pike with telling effect.

The blue, and common white shark came around me quite often, while diving on the Silver Banks. The specimen of the white shark which we killed, measured twenty feet, and five feet across the head; but, I did not receive the least harm from any animal while diving on those banks; nor did any of our crew.

The smaller inhabitants of this watery domain, did not venture near enough to what seemed an unwelcome visitant, to receive my instrument of defence; unless it was when I was rising to the surface; when like curs on "terra firma," they followed their retreating enemy even to the surface, often attacking my armor and leaving such marks of their vengence as to make it require repairing.

As I sank down it was quite different; but a fish or two at first would come near me, and then instantly disappear but they would soon return with shoals of their kind, and after sailing around me once or twice, the fish of one shoal would attack that of another, and in the battle, many would be slain on each side and drowned by their adversaries.

There is one narrow channel through the center of these Banks, where ships may cross, but they seldom do so, for it can only be done safely in calm weather. In many places at the sides of this deep passage the coral can be seen at low tide, above the surface of the water; and it was on one of these that the frigate "Sovereign," was wrecked.

There have been more than forty shipwrecks on these banks, besides unknown numbers of vessels which have gone down, with not a single soul on board saved, to tell the woeful tale.

There is many a beloved father and brothers' bones imbedded in those coral caves, of whom hope still lingers in the hearts of those who loved and held them dear. And to whom their sad fates will never be made known.

CHAPTER XII.

Preparation for Diving to the Steamer "Atlantic"—The Safe found—Experience in Diving—Removes the Safe—The Last Dive to the Steamer—Symptoms of Sickness—Paralyzed—Taken to Port Dover—Partial Recovery—The Letter.

It is said that there is nothing on earth to which man will so eagerly cling, as to gold. That it occupies his thoughts by day—his dreams by night; and, true to this passion, that wealthy safe at the bottom of Lake Erie had been rife in my mind, during all my adventures on the "Silver Banks." On my return to Boston, I made immediate preparations for raising it, and returned to Buffalo for that purpose. At that place I chartered the schooner "Yorktown," with which to proceed to the wreck of the "Atlantic." With eighteen men, I started for Long Point, where I arrived on the 14th of August. After several days spent in taking *bearings*, and in sounding, we succeeded in finding the spot where the wreck lay—five miles south of the extreme point of the Peninsula. Here we let down grappling irons to both bow and stern, and secured them above with buoys. I then commenced diving; and, as in my former trial, I found it was total darkness at the depth of the wreck. On reaching the boat, her decks were covered with mud some ten inches in depth; but what was more marvelous, she had changed her position. Her bow, which was headed southwest when I first went down, was now southeast, having changed nearly a quarter of the compass. She lies on a smooth slate bottom, and I thought I could see her move at times; and I presume she does move considerably in rough weather. It is a great pity that this wreck is left to decay, when it could be so easily raised by proper machinery. I was laughed at for suggesting that the hull of the "Erie" could be raised, much more when I attempted to do it. Nevertheless, the hull was brought up, and part of it was towed into the port of Buffalo; and, had I the health I once possessed, that of the "Atlantic" should again see the surface.

After diving five or six days in succession, I found, by groping my way, the locality which I wished to search; but my only way to get to it without great impediment, was, when I went down, to strike on the wheel-house, and follow this down to the deck, and then follow the deck along to the third window from the wheel-house, aft. On the morning of the twenty-third, I reached the spot, and, placing my arm through the window, I laid my hand on the much sought for safe.

I immediately arose to the surface, obtained a line, went down again, and fastened it to the railing opposite the window of the office of the American Express Company, the line extending to the surface. This was done to enable me to descend at once to the place. I also attached a buoy to the line, ten feet below the surface, that, in case of a storm, and we were obliged to leave the wreck, it would not be carried away by passing vessels.

While endeavoring to ascertain the location of the safe, I could safely stay down no more than twenty to thirty minutes. While down, I experienced much pain from the pressure of the water. A sensation was constantly felt between the eyes, as if a needle was piercing there; sparks of various colors flashed before my eyes, and the drowsiness, as in my former attempt, constantly attended me, all of which was occasioned by the insufficiency of air in the armor, as, with our pumps, it was almost impossible to force the air down to such a depth.

At noon, I unguardedly partook of a hearty meal. I was at the same time very warm, and much elated at the prospect of success, so flattering. That thirty-six thousand dollars, thought I, before nightfall would, in all probability, be mine. That safe was found, which had so long baffled my skill, and to procure which I had hazarded money and almost life.

On going down again, I took with me an iron bar and a saw, and while down, I succeeded in cutting away so much of the cabin that it allowed me to drag the safe out, and I left it between the cabin and the railing.

I then arose for a rope and hook, and found that I had been down just *forty-seven minutes*, but, notwithstanding, felt perfectly well, and would have instantly returned had the rope and hook been at hand. As they were not, I removed the face of the armor, and sat down to wait for the implements. I had sat but a moment, when a sharp pain shot like lightning through my lower extremities, and the next instant it went through my whole system, so prostrating me that I could not move a limb, or even a muscle. I was immediately taken to Port Dover, where I had medical attendance procured me, After lying here two weeks, I was brought to Buffalo, where I received every attention. The best physicians pronounced me incurable. I remained in Buffalo ten days, but I did not improve in the least. I was then removed to my home in Boston, where it was five tedious months before I could step; and in the spring I was only so far recovered as to walk a very little with crutches.

The following extract from the letter of a correspondent of the New Haven (Ct.) *Journal*, will give the reader some idea of the perils which beset me at the wreck of the Atlantic, and perhaps give additional weight to my description:

"PORT DOVER, C. W., August 27, 1855.

"You no doubt have heard of the many unsuccessful attempts to obtain the money chest lost with the steamer 'Atlantic,' three years ago, said to contain $36,000. The statute, I believe, limits the claim of ownership over property thus lost to three years. In this case the time limited expired on the 20th inst., and Green, the celebrated submarine diver, reached here on the 21st, in the canal-boat schooner 'Yorktown,' Capt. Patterson, on his way to the wreck, twenty-five miles distant. They returned yesterday, and being well acquainted with Capt. Patterson, I obtained the following particulars from him:

"About ten o'clock (says Capt. P.) on the 24th, all being ready, Green descended by means of a line, which, having a grapple on the end, had become fast to something below.

"He was dressed with three pairs of flannel drawers, three shirts, also flannel, three pairs of woolen pants, three coats, and three pairs of woolen stockings, surmounted by his submarine armor. On his feet he had a pair of stogy shoes, with lead soles one-half or five-eighths of an inch thick, and a belt of 80 pounds of shot around his body, to sink him, and the breast-piece of the armor cannot weigh less than fifty pounds.

"Taking hold of the line, he descended, finding it perfectly light, so that he could see all around him, to the depth of sixty feet, when it grew dark, and, for the balance of his fearful journey amid the caverns of the deep, he was guided solely by the line until the depth of 140 feet, when he struck bottom, or something which he soon made out to be the wheel-house of the ill-fated boat. Groping along, he slid on the hurricane deck; from thence to the guards of the boat. By poking around, he discovered the precise position of the boat, and found himself not far from the sought-for office, and made fast the end of a line which he had carried down with him, to a stauncheon near the gangway, and, giving the signal, he ascended, taking with him a piece of the wheel-house, which he had secured, (a piece of which, about eight inches long, four inches wide, and one an a-half inches thick, was sawed off and presented to me by the Captain of the 'Yorktown.' He had gone down, in all, 152 feet, and remained just forty minutes.

"After resting, he again descended, having first partaken of a hearty meal, without removing his dress, save the head-piece. His excitement was intense at his great success thus far; and when he descended the second time, he was quite hot, (the day was intensely hot.) Descending by his second line, he soon stood on the deck. Feeling his way along, he soon reached the third window, which, being unbroken, he shattered it, and reaching in his hand, at last laid it upon the much-coveted safe, just in the position which had been described to him. Not being able to reach far enough to make his line fast, he again ascended for a hook to hook through the handles. Reaching the deck, he made known his success and requirements; and, as no hook was ready, sat down until one could be secured to a line. As they were about ready, he rolled over, saying he was sick. They stripped him, and did all in their power for him, but were finally obliged to buoy the lines, and make sail for this place for medical attendance. They reached here at noon yesterday, and two physicians were immediately called, who expressed their opinion that he could not live: however, they labored faithfully with him, and at night pronounced him better; and this morning, although not out of danger, it is thought he will live, and is in a fair way for a speedy recovery. He says, if his life is spared, he will yet be the owner of that chest."

Even in this crippled state, I was loth to give up the trial, which, in the moment of success, sickness had obliged me to abandon; and, bidding defiance to sickness itself, I again repaired to Buffalo in June, 1856; and, after fitting out another vessel, I sailed for the place of the wreck, where I arrived on the first of July. I found that the line which I had taken so much pains to make secure the previous season, was missing. This was a severe loss to me, as it would have directed me instantly to the place of the wreck. On again finding the location, I was not a little mortified to find that the divers whom I had engaged to go down to the wreck, refused to do so, the farthest they sank being not over sixty feet. But I was not to submit tamely to this unexpected barrier, and, putting on the armor myself, I at once went down, striking on the upper deck. I found it dangerous work for me in my crippled state, and being quite weak, I could remain down but a short time. From my previous diving, I had a pretty correct idea of the wreck, and had but little difficulty in making my way to the place where I expected to find the safe. On diving to the wreck on the fourth of July, I reached the spot where I left the safe the previous year, and imagine my disappointment, when I found that the prize for which I had almost lost my life once, and risked it again, was gone. Crippled as I was, I worked myself along to the next door —a state room—in which there was a trunk containing seven hundred dollars in gold. The trunk was also gone. I felt for the safe again. It was gone. All—all my efforts for nothing! Never—never did I rise to the surface with so heavy a heart! On emerging, I was again paralyzed, prostrating me equally to my former shock. I was immediately brought to Buffalo, and by treatment which I was then familiar with, but knew nothing of when I first felt my former attack, I was restored to my present disabled state.

There have been many conjectures in regard to the cause of my paralysis. Some attribute it to my meal; others to the pressure of the water. There is one thing which I shall mention as having something to do with it. The pumps which were used for forcing air into the armor was of brass, and with each movement of the pumps, I could plainly taste and smell the copper in the atmosphere I breathed.

When we arrived at Buffalo, we ascertained that a Mr. Harrington succeeded in raising the safe on the twenty-seventh of June, the very day we started for the wreck. In my previous diving, I had proceeded so far that there was nothing to be done but to descend once, and merely hitch a hook into the handle of the safe. I had removed the part of the cabin in front of the safe, and had drawn it to a proper place to hitch on to it. My buoy was also there, attached to a cord leading directly to the spot; and all Mr. Harrington had to do was only to descend to the boat, and remain down perhaps ten or fifteen minutes at the furthest.

It was said by the gentleman who obtained the safe from the "Atlantic," that he "*saw persons sitting in the cabins of that fated boat, as naturally as if nothing had occurred,*" although, at that time, the boat had been down three years. Every person must at once see the fallacy of such a story. Is it supposed that persons on board of a ship would sit perfectly unmoved when such a catastrophe happened, and thus go to the bottom? when it is remembered that the air in the body would raise them to the top of the cabin, could they rise no further, at least three times, unless they clung to something immovable, either of which would destroy the calm position of sitting; and if all this were not true, they would, in all probability, rise when decomposition began to take place.

The fact of the bodies rising when in ships sunk, was demonstrated to me in a wreck which I dove to near New Orleans, sunk in only forty feet of water. I recovered the bodies of eight men, two females, and a boy. Some of these bodies were floating up to the cabin ceiling, while others were inclined to an angle of about forty-five degrees; but all floating about in the ship.

In the spring of 1857, I again started with a small vessel, which I had constructed with a view to submarine wrecking. I proceeded to Lake Huron, where, about Thunder Bay Island, Middle Island Reef, Presque Island, I obtained various kinds of freight and iron, which had been thrown overboard by vessels at different times, in that dangerous locality. But not having good divers, and being too disabled to dive much myself, I found the business unprofitable; and, after remaining there some little time, I returned into Lake Erie, and proceeded to the wreck of the propeller "City of Oswego." On arriving at the place of the wreck, the water was so rough that I could not work, and I was obliged to endeavor to make the port of Cleveland, in doing which my little craft struck the pier, and with that disaster, ended my Submarine Diving.

CHAPTER XIII.

Peculiarities of different divisions of the Earth—Hints in regard to the water of the Lakes—Caverns in the bottom of the Lakes—Hot Spring.

The different divisions of the earth are noted for some striking natural peculiarity—Europe for its scenery, Asia, for its lofty mountains, Africa, for its Great Desert; South America for its large Rivers, and North America for its Lakes. Those which lie between the United States and British America, being the largest in the world, discharging ninety million tons of water over the Niagara Falls every hour. Nor are they less noted for the purity of their waters, which is preserved from their head to the Gulf of St. Lawrence—a distance of two thousand miles.

Whence comes this vast quantity of water, is it from the many small tributaries (for there is not a large one) emptying into these lakes? Perhaps the following facts may give some hint to this phenomena which I discovered during my researches in those Lakes.

While I was diving in Lake Erie near the little port of Silver Creek, I discovered crevices in the bottom of the Lake, through which water in large quantities rushed up and flowed off in similar channels to those of rivers upon the land, growing wider not so rapid, and more shallow, until they were lost in the deep waters of the lake. I went down into some of these caverns as far as I deemed it prudent, to force my way against the strong upward current of the water. The sides of these caverns were very irregular; in some places sloping, in others, ledge after ledge of rocks formed steps, down which one might walk. In others caverns led off in horizontal directions, through which the water rushed with great force; and into which, I am free to confess I did not dare to enter.

The largest cavern that I found, was nearly one hundred and seventy-five feet long and thirty to forty feet wide, irregular in form like a seam in rocks. The current of water which it discharged run at the rate of four or five miles an hour, boiling up vertically in some places, in others, shooting at an angle of about thirty degrees. This crevice was but a short distance from the wreck of the "Erie," and the lake there was about seventy feet in depth.

In diving on the outside of Middle Island, in Lake Huron, I frequently found places where the water was rushing down through the rocky bottom at the slope of the reef. I descended into these crevices a short distance, but as this was after I was paralyzed, I feared I might be drawn into some small crevice by the force of the current as I had not my usual strength in my crippled state.

The depth of the lake above these apertures was from fifty to one hundred feet, the crevices were from ten to twenty feet in diameter, and the water rushed down with great force, taking whatever came in its current.

It will be perceived by the reader that this phenomena is exactly opposite from that witnessed in Lake Erie, and it would seem to indicate the existence of a large river between Lake Huron and Lake Erie: or is it the cause of the fall and rise of the lakes? There was also, springs of an enormous size at the bottom of these lakes varying from five to fifty feet in diameter. I discovered one fifteen miles east of Cleveland and near where the Propeller Oswego was wrecked, this was about fifteen feet wide, and twenty long. At the head of Lake Erie, on the reefs near the West Sister, I discovered a spring so hot that I could not approach on one side of it, I also, saw many others.

I have heard it often stated that the vast praries of the West were once the bottom of extensive lakes. On these there are little lakes and "sink-holes," often many yards across and hundreds of feet deep. Those springs in the bottom of Lake Erie; are, undoubtedly, analogous to those bodies, and should that lake ever become dry, present the same appearance.

What influence these numberless springs may have upon the rise and fall of the lakes, (a subject which has lately received so much attention,) it is not for me to say. I give only facts, let those more conversant with the structure of the earth than myself, draw conclusions.

Independent of these rivers and springs, I found the bottom of Lake Erie diversified into hills and dales, rolling surfaces and extensive plains.

The waters of the lakes although so pure, did not possess the crystal clearness of the Ocean upon those Silver Banks; had it, I should have possessed the safe, which was so artfully snatched from my grasp, the first time I visited that wreck. But, as that is gone, I may at some future time, should fortune smile, endeavor to obtain that valuable Steamer herself.

CHAPTER XIV.

How to Float on the Water—Swimming—Directions for Diving with the Armor—Precautions—Who make Good Divers—The Diving Bell—Blasting Rocks under Water.

In the previous chapters of this work, I have given the reader my principal exploits in connection with submarine diving. It now remains for me to give that observation which I have learned from those practical demonstrations. The art of submarine diving, both with and without armor, and the effects of the water upon the body in its natural state, with armor, and after death, although they have been hinted at in preceding chapters, require further demonstration.

It is a well established fact, I believe, that the specific gravity of the human body is less than that of water, so long as there remains sufficient air in the lungs to even keep them but partially filled; and this difference is sufficient to permit of the body floating with the mouth and nostrils free for respiration, provided the face be turned upward, and the head thrown back, so that the greater portion may be immersed, and its weight sustained by the water. It is also a well known fact, that if a person throw himself into the water, the body will rapidly rise to the surface, and assume nearly a vertical position, and that the upper part of the head, down to a little below the eyes, will remain above the surface. This position is occasioned by the greater density of the legs and thighs, in proportion to the head and chest, which acts as a kind of float or buoy to the body. In this situation, however, it would be impossible to breathe; but, if the head be thrown back, so that the face may become the exposed part, as before mentioned, respiration may be carried on without hindrance.

The truth of the above I have frequently demonstrated in my diving without armor. I found at each inspiration, a large portion of the face became raised above the surface, and at each expiration it sunk so that the water came nearly to the corners of the mouth, but not high enongh to run into it, unless a hurried and forced breathing was resorted to. Thus a constant rising and sinking of the body takes place, and these motions are simultaneous with the inflation and contraction of the lungs. If a hand and part of the fore-arm be raised out of the water, the face becomes instantly submerged.

From what I have said, it is evident, that, if one falls into the water, and exercise but common presence of mind, he may readily float for some time, or until assistance can reach him, even although unacquainted with swimming. Unfortunately, however, persons on falling into the water, are so agitated and alarmed, and the general ignorance of the principles here related, which could be resorted to in such emergencies, make them neglect those obvious measures which are essential to their preservation. Persons falling into the water should be as collected as possible, and avoid splashing and throwing themselves about in the water as much as possible, as this will increase the danger. They should allow the body to assume its natural vertical position, and, if they cannot swim, should remain patiently until assistance reaches them. Another point which should be remembered by every person under such circumstances, is, that there is a considerable amount of residual air in the lungs in a nearly deoxydised state; and if this be expelled by two or three forced expirations, and a deep inspiration then be taken, a large quantity of vital air will then be introduced into the lungs, and the blood will continue aerated for a proportionally longer time, and consequently a longer period will elapse before another inspiration will be required. It will be found that if, in the ordinary course of breathing, we suddenly hold our breath, we will only be able to do so for the space of time varying from twenty to thirty seconds; but if, on the contrary, we prepare ourselves by taking two or three forced expirations, and then taking a full inspiration, we remain from one, to two and a half minutes before another respiration need be made.

The above was the mode adopted by me when diving, and I believe it is the practice of all divers, and especially pearl fishers, and they are remarkable for remaining under water for a long time.

A person in danger of being cast into the water should have recourse to this method, as it would permit the breath to be held until the body rises to the surface of the water, and would obviate the dreadful effects of attempting to breathe while the mouth is submerged.

The above direction for floating will enable one to stay upon the top of the water, but not instruct in locomotion, and the following will be found useful in learning to swim.

There are two modes of swimming in common vogue—

one which is commonly called "frog fashion," and the other, "swimming on the back." There are other modes, such as "dog fashion," and "swimming on the side," but they can hardly be said to be useful.

In swimming "frog fashion," the hands and arms should strike a half-circle on the same horizontal plane with the body in the water, the arms extended, and pushing the water with the flat hand. The hands should start in front of the face, and be brought around nearly to the sides. In returning the hands and arms to strike another blow, they should be kept as close to the body as possible, with the hands held parallel to the surface of the water, until they arrive at the point where another blow is to be commenced. The feet should be kept close together, and drawn up and pushed out at each stroke of the arms. The head should be only so much elevated as just to keep the water from entering the mouth.

To swim on the back, the body only needs to be placed in the position for floating; the hands should be laid upon the thighs, and the feet worked as in the description in the former mode. This mode of swimming is far from being as laborious as swimming with the face down; but, on the other hand, one makes but slow progress in the water, and it is only useful in resting, while swimming in what seems the more natural mode. The same may be said of the other modes which I have only mentioned.

The best time of day to go into the water is in the morning before eating, and, in fact, persons should never go into the water on a full stomach, nor soon after drinking liquor. These precautions should be attended to, and are of the greatest importance to the diver—he cannot work under water if his stomach is filled with liquor. I have seen divers abandon a search, solemnly averring that no one could reach the treasure, when the sole cause of their disagreeable feelings arose from the state of their stomachs from liquor.

Persons who cannot swim should be very careful about adventuring in water where it is above the shoulders in depth. The better way to learn to swim is to first wade into the water as far as it is prudent, and then endeavor to swim toward the shore. In case of cramp, or fright even, it will, in this situation, be an easy matter for one to save himself, while it is often impossible, when the water is so deep that the novice cannot wade.

In case of cramp, the swimmer should exercise the greatest presence of mind. Fright should be avoided, and the person should endeavor to swim with those limbs which are unaffected, although the severe pain for the moment would seem to stifle the whole body. If it is impossible to swim, the position of floating should be assumed, and quietly retained until help is at hand. The horror with which a person is filled on being seized with cramp, is too often the sole cause of death.

In diving without armor, the above precautions should always be taken, for therein lies the secret of remaining under water. When one is once submerged, he will find he can swim down almost as well as toward the surface, and remain down, if desired, at almost any depth. As I have stated in a previous chapter, I have dove forty-two feet below the surface, and remained down from two to three minutes. I found the pressure of the water no more at this distance than it was five feet from the surface. In my acquaintance with other divers, I knew one who had been down fifty-four feet without armor. He stated that the result on the body was the same as with myself; and I believe this is the experience of all divers without armor.

These hints on floating and swimming, are, I believe, in accordance with scientific experiments, and can be found, in the main, in a few other publications; but we are unacquainted with that book which has given any directions for diving with armor, and the following hints cannot fail to receive notice from many.

The diver having used due precaution in regard to eating, previous to descending, should go down quite slow, decreasing in speed as he decends until he reaches the bottom. On lowering, he will feel a pressure on his lower extremities, which will increase as he proceeds on his downward course until it reaches even the chest, and cause a rush of blood to the head, which gives a sensation between the eyes as though needles were piercing there. A sharp snapping sound is also produced in the head from the same cause; singing sounds are heard in the ears, which increase until the diver reaches the bottom, and obtains a vertical position, or an inclination of about twenty degrees forward—an angle of the body necessary to move about at any considerable depth. When in either of these positions, he is almost entirely relieved of these disagreeable sensations.

When the diver has worked for some time, he will become dizzy, and symptoms of nausea will follow; and if these symptoms are violent, he should be drawn up at once, for these disagreeable sensations arise from foul or insufficient air.

There is a great mistake made by some divers, who suppose that air should not be forced to them in greater quantities than they actually wish to breathe. The diver should always have enough air in his armor to keep it entirely expanded, and attain that force which will expel the impure air.

While life is sustained by retaining the oxygen of the atmosphere, it is equally important that the nitrogen should be expelled by expiration, and, when the expirated air in the helmet does not pass off as rapidly as it is expirated, it will cause all the symptoms here described.

I have seen no armor, except those constructed after my improved plan, that will make the diver comfortable while submerged. I have, in a previous chapter, explained the construction of that armor, but I will here recapitulate those points so essential. The air-pipe should be attached at the front, near the pit of the stomach, instead of at the top of the helmet; the escape pipe should be at the back of the head, instead of the breast, and it should extend as low as the hips behind. There should be a valve attached at the end of the escape pipe, and also one at the entrance of the air-pipe, that, in case of accident to the air-pipe, the one would prevent the air from escaping, and the other would keep the water from running into the armor while the diver was being drawn to the surface.*

Many divers have lost their lives by not having these safety valves attached to their armors. Captain Glennie, a noted diver, in the service of the "St. John's Diving Company," while working off New Brunswick, near St. Johns, had a narrow escape of his life in this manner. He had been under water for two hours, looking for a mooring anchor, and had just decided to come to the surface when the air-pipe burst above the surface of the water. He was drawn up instantly, but, on opening the armor, his head was found badly swollen, the blood gushing from his nose, eyes, ears and mouth, and his whole countenance was very dark; and it was beyond the hope of any, that he recovered from this almost fatal accident. Had there been these valves attached to his armor, such an accident could not have occurred.

When an armor is perfect, the diver can remain down from thirty minutes to nine hours, according to the depth of water; but I am inclined to the opinion that four or five hours is as long as it is prudent to remain under water at a time.

---

* The amount of pressure in fresh water may be estimated, at 15 feet below the surface, at 7½ lbs. to the square inch; 30 feet below, 16 lbs., doubling in this ratio as you descend. There was pressure upon 2200 square inches of surface of my body. My greatest descent in fresh water was 162 feet; and in salt water 158 feet. One cubic foot of fresh water weighs 62½ lbs.; one cubic foot of salt water weighs 63½ to 64 lbs.. varying in proportion to the amount of salt held in solution.

I have executed almost every kind of work which would be likely to be required below the surface, except chopping, which can not be easily done, as the water expends the force of the blow, and it is with great difficulty that the least gash can be made. Sawing, prying, moving bodies, and lifting, are easily done; and I am sure that a diver can lift more under water than he can above. I am well aware that it is a general theory that it requires a far greater force to lift bodies under water than it does out; but this only occurs where there is no water under the object to be raised, which are very seldom the case; therefore, the fabulous weight which is talked of lifting, in order to raise wrecks, is, to a great extent, overestimated.

Another common error is, that bodies find a centre of gravity in the ocean before they reach the bottom. In one hundred and fifty-two feet of water, I found that bodies apparently sunk as quickly as in five feet of water, and the pressure on my hands, which were exposed, was no more than would be felt in ten feet of water. Were it actually the fact that heavy bodies did not find the bottom of the ocean, I cannot see, for the life of me, why the bottom of the ocean should not also rise; and if this were the case, what would become of the water. Every thing, so far as my experience in diving goes, shows that bodies which sink in the ocean go to the bottom of the water in which they are submerged.*

To counterbalance my position, I have been often referred to the fact that the ocean can be sounded only to a certain extent. The reason of this fact is, that the line attached to the lead in sounding to such a great depth, buoys the lead along with itself, and prevents it from sinking any further.

Water cannot be compressed, and the pressure of liquids is the same on all sides; therefore, to whatever depth a body may sink, it never becomes lighter than the water by reason of such depth. Before I return to the subject of diving, I would ask those who entertain different views on this subject from my own, to calmly view these points before pronouncing my doctrine erroneous.

---

* We have often seen the experiment of sinking an empty bottle, corked, and when it was drawn up finding it filled with water. This was owing to the fact that there was a vacuum, into which the water, by pressure on every side, must rush, and the little air in the bottle escapes, unless the bottle be lowered neck downward, in which case it will not entirely fill.

I have universally found, that persons of dark complexion, and of billious temperament, can stand the arduous toils of diving far better than light, nervous, or sanguine temperaments. The latter temperaments are troubled with pressure of blood to the head, to such an extent as to render it impossible for them to remain down but for a short time.

One great requisite to success in diving is endurance, to which must be added cool judgment, perseverance, and a determination to go through thick and thin, and not cower as the "*salt water divers*" did at the wreck of the "Atlantic." Without the above requisites, no person need think of becoming a diver; for the pain which he will have to endure in deep water will make any but a stubborn heart retreat.*

What improvements may hereafter be made in diving I will not pretend to say; yet, I am convinced that there can be much progress in the art. Still, it has already been brought to such perfection that it imparts to commerce a valuable practical benefit; while by the aid of sub-marine armor, the bodies of friends and relatives may be rescued from their watery graves, and deposited where their last resting places may be known.†

We give the following description of a Diving Bell from *The Penny Magazine*, but the apparatus has now given way to the Submarine Armor, which is far more useful, and less hazardous to the diver. All of the merits stated in the article apply, in ten-fold force, to the submarine armor.

"The Diving-bell is an apparatus extensively employed by the engineer in many difficult operations connected with his arduous pursuits. Not only are rocks blasted by the force of gunpowder *above* the water, but below; and the spirit-level of the plumb-line, and the nicely fitted joints of the stone-mason, are quite as much attended to at any reasonable depth below the surface of the *sea* as in the mightiest works on the *land*. Low water-mark is no longer a limit to the operations of the engineer; and he now lays his foundation on the edge of a sub-marine precipice, with the same security and precision as characterise his noblest operations on the ground.

---

* There is one result from diving, which I wish to state, not as a universal fact, but as an effect on myself and one other diver, who were troubled with the unmistakeable symptoms of consumption. It proved an effectual remedy. By the forcing of air into the armor by means of the air-pump, it was supplied in such quantities that the air became condensed, and consequently entered and expanded the lungs. To this fact I attribute the cure.

† I have found and recovered bodies under water in every state of decomposition; often so decayed as to drop to pieces when I picked them up, nothing remaining of others but the bones; while others in a less decomposed state, were covered with shrimps, and partially devoured by fish—a sight which made the heart sick.

The diving-bell commonly in use resembles nearly a large box deprived of its bottom. Its ordinary length is about six feet, its breadth five and a half, and its height four feet and a half. To avoid the necessity of fastening weights to make it descend, it is formed of cast-iron; and being made in one piece, and very thick, there is no danger of the water forcing itself through the sides or top. It is also air-tight. The thickness of the sides of the bell prevents also its being fractured, should it by any accident receive a heavy blow.

In the top of the diving-bell is a round aperture, communicating by a number of small circular holes with the interior, where the holes are all covered and closed by a piece of thick leather, which acts as a valve, and admits air. A strong leather hose is screwed on to the external aperture, and from two holes near its sides rise two strong chains, uniting in a ring, by which the whole machine is to be suspended. In the top also are cemented twelve very thick lenses, for the purpose of admitting light. At the ends of the bell are two seats, placed at such a height, that the top of the head is but a few inches below the upper part of the bell; and in the middle, about six inches above the lower edge, is placed a narrow board, on which the feet of the divers rest. On one side, nearly on a level with the shoulders, in a small shelf, with a ledge, to contain a few tools, chalk for writing messages, and a ring, to which a small rope is tied. A board is connected with this rope; and after writing any orders on the board with a piece of chalk, on giving it a pull, the superintendent above, round whose arm the other end is fastened, will draw it up to the surface, and, if necessary, return an answer by the same conveyance. "Our compliments to our friends above water;" was the little memorandum written by the author of this brief notice, when he formed one of a happy party at the bottom of the sea. "Health and prosperity to the ladies and gentlemen inhabiting the region of fishes," was the answer which was received to it in less than three minutes.

On the top of the bell, on the inner side, it is usual to have some contrivance, by which stone or other bodies may, if necessary, be suspended from the bell. The weight of the whole apparatus is about four tons. The leather hose is connected with a double condensing pump, usually worked by four men. In order to give motion to the bell, it is suspended by a windlass purchase-tackle, which is fixed on a moveable platform, having four wheels; these wheels move along in an iron railway, which is itself fixed on another platform, having by the same means a motion in a direction transverse to the former, at each other. Thus by two iron railways, established on beams and supported by piles, the lower being fixed in the direction of the length of the wall, and the upper being on the lower moveable plane, it is possible to give the bell any position that may be required.

There are many prejudices against diving-bells, just as there were once against stage-coaches, steam-boats, and travelling by the power of vapor on rail-roads. Some of our readers, who have possibly misgivings respecting the safety of a descent in a diving-bell may be induced to enter one, after they have read the following account by Mr. Babbage of his descent with Mr. Harvey in a diving-bell at Plymouth:—"To enter the bell, it is raised about three or four feet above the surface of the water; and the boat, in which the person who propose descending are seated, is brought immediately under it. The bell is then lowered, so as to enable them to step upon the footboard within it; and having their seats, the boat is removed, and the bell gradually descends to the water.

On touching the surface, and thus cutting off the communication with the external air, a peculiar sensation is perceived in the ears; it is not, however, painful. The attention is soon directed to another object. The air rushing in through the valves at the top of the bell overflows, and escapes with a considerable bubbling noise, under the sides. The motion of the bell proceeds slowly, and almost imperceptibly; and on looking at the glass lenses close to the head, when the top of the machine just reaches the surface of the water, it may be perceived, by means of the little impurities which float about in it, flowing into the recesses containing the glasses. A pain now begins to be felt in the ears, arising from the increased external pressure; this may sometimes be removed by the act of yawning, or by closing the nostrils and mouth, and attempting to force air through the ears. As soon as the equilibrium is established the pain ceases, but recommences almost immediately by the continuance of the descent. On returning, the same sensation of pain is felt in the ears; but it now arises from the dense air which had filled them endeavoring, as the pressure is removed, to force its way out.

If the water is clear, and not much disturbed, the light in the bell is very considerable; and even at the depth of twenty feet, was more than is usual in many sitting-rooms.

Within the distance of eight or ten feet, the stones at the bottom began to be visible. The pain in the ears still continued at intervals, until the descent of the bell terminated by its resting on the ground."

Signals are communicated by the workmen in the bell to those above, by striking against the side of the bell with a hammer. Those most frequently wanted are indicated by the fewest number of blows; thus a single stroke is to require more air. The sound is heard very distinctly by those above.

Considering the extensive employment of the diving-bell, few serious accidents have occurred. Some years since, the bell at Sheerness rested on the top of an old pile. The men within repeatedly gave the signal to lower instead of to raise the bell. This being obeyed, it fell over, and two out of three who were in it, were drowned; the third came to the surface, and was saved. On another occasion at Blackwall, a bell, of which trial was being made on ship-board, was mismanaged. There were three persons below when the water began to fill it. One of them, with great presence of mind, dived underneath the edge, came to the surface, gave the alarm, and saved his companions.

Rocks at the bottom of straits and rivers, which impeded navigation, have been blasted away by this use of the submarine armor. The rocky channel of "Hurl-Gate," long a terror to the navigator, in passing its rough and dangerous channel to our commercial metropolis, has been almost entirely cleared of its jagged rocks by the submarine diver, and he refers to it with pride as an illustration of what his art can do. It is no less useful in constructing walls beneath the surface of the water, and, I might say, that almost every labor which requires to be executed below the surface of the water, is now done by the marine diver.

The process of blasting beneath the water is as follows: A canister is prepared, containing powder in proportion to the size of the rock to be blasted. (If the rock is a very large one, three hundred pounds is often used.) In the side of the canister are inserted two wires, enclosed in gutta-percha. The ends of the wires enter the can, and are united with a small platina wire, and the finest powder is used about this wire as priming. The diver descends, and places the can on the upper surface of the rock. The other ends of the wire are attached to a boat lying at a safe distance from the spot where the explosion is to take place. By working a battery, the powder is ignited, and instantly is seen, over the rock, or place of the powder, a semiglobular volume of fire, some twenty feet in diameter, and ten feet high. This consequently forms a vacuum of about the same dimensions; and it is the common belief, that, as the water presses from all sides on its centre, to fill the vacuum, it breaks the rock into pieces. Some, however, are inclined to think it is the shock of powder acting on the rock at the same time it acts on the water. There is an immense body of water moved, why not allow the powder to remove a little rock as well as so much water? The effect is so tremendous on the water, that it often throws it into the air two or three hundred feet, and kills fish five hundred feet from the place of blasting.

CHAPTER XV.

Different Kinds of Apparatus for Diving—Diving with Armor not understood by Writers on the Subject—Who first made the Armor serviceable for Diving in Deep Water—Harrington at the "Atlantic"—Conclusion.

The different kinds of apparatus which have been constructed for diving are classed under three heads. The armor, which we have heretofore described; water tight vessels, of such capacity that they will contain air enough for the diver to breathe while down from ten minutes to one hour, without becoming too much impure; and the diving bell, which an article from the "Penny Magazine," in another part of this pamphlet, fully explains.

According to history, armor is the most ancient of the three. A Frenchman, by the name of M. Klingret, as early as the year 1798, constructed an armor of pieces of tin, riveted together in such a way as to make a water-proof encasement for the body. There were two flexible pipes attached to this armor; one which was attached to the head, and terminated in a mouth-piece inside of the armor, and extended to above the surface of the water. When the diver wished to draw a fresh breath, he placed his mouth to the pipe, and took an inspiration. The other pipe was also attached to the head of the armor, extending to the surface, and through it passed off the expirated air, and thus kept up an equilibrium within the armor. With this apparatus, it will be at once apparent to the reader of the preceding pages, that it would be impossible to remain under water for any length of time, and especially not at any considerable depth, as there is nothing but the armor to counteract the pressure of the water. Not knowing that such an armor had been constructed, I myself had one made of plate, and, on trying it, I found that the pressure of the water on the armor was so great that I could not move a single joint in it, although I had, while making the experiment, constantly forced into it condensed air. It was entirely useless.

Water-tight vessels were never brought to such perfection that they rendered any great utility to the diver. They were generally constructed so as to open for the convenience of being put on, taken off, and to leave the arms and legs free. Others were constructed so as merely to cover the head, and yet large enough to contain a quantity of air which sufficed the diver for the limited time he was submerged. There has also been, at various times, different kinds of apparatus from any described here, experimented upon for the diver; but I do not consider their descriptions of any use to the reader, and must therefore pass them by.

The "Encyclopedia Britannica," states that there is no armor or apparatus yet constructed which is of much value for diving, except the diving bell; that with the armor it is only possible to descend ten or fifteen feet, that it is necessary to have the armor made of the greatest thickness, to prevent the water from pressing the body, and that, should the least water get into the armor, it must cause instant death.

It is very evident from these remarks, that the writer of the article referred to knows nothing of the construction or working of my new armor. It is not even intimated in the lengthy article on the subject of diving, that it is necessary to have air pumped into the armor, to counterbalance the pressure of the water; nor is it anywhere expressed that the body, when unprotected from the water by water-tight garments or cases, does not feel the weight of the water sufficiently to produce any bad results; but, on the contrary, the opposite is intimated. Should my armor break, so as to admit the water, there could result no great harm therefrom before the diver could be drawn up, and I am quite positive it would be the same with the one described in that work.

The whole of the article referred to represents the armor as a worthless apparatus, that *cannot be used in deep water,* and of little value in any work. But I would like to have any book referred to me which gives an account where work like the raising of the "Erie" has been prosecuted with the *diving bell*, let alone my adventures at the wreck of the "Atlantic," or even my operations at the Silver Banks. The diver in armor can go all over and about a wreck, even into state rooms and into the hold of the ship; he can remain down hours, and prosecute work which it would be impossible to do with the diving bell. And it appears not a little strange to me, that there should be so little knowledge displayed on a subject so important, in a work of the general accuracy of the "Encyclopedia Britannica." I should judge from these errors that my armor had not yet reached the other side of the Atlantic, did not the "New American Cyclopedia," which is not even as far advanced as the great British work, fall into almost the same error, dwelling lengthily on the diving bell, while there is but little explaining the armor, although it relates the circumstance of Mr. Harrington's procuring the safe, which I had almost, as it were, placed in his hands. We must correct the last mentioned work, where it states that Mr. Harrington used simply an India rubber armor. He operated with one made very nearly after my improved armor. That he did not find the safe in a state room, but on the outside of one, next to the railing of the steamer, where I left it on my ascent previous to my first stroke of paralysis. The dates also are wrong, but that is of small consequence.

That it was total darkness sixty feet below the surface I doubt In diving to the wreck of the "Erie," it was quite light at seventy feet, and each time when I was at the same wreck I could see, one hundred feet below the surface of of the water. Could he not have seen he had a line to direct him with unerring step to the prize—a line which cost me hundreds of dollars; and my health, to place there. If it was actually the fact that he could not see in the least, it must have been from the peculiar state of the water at the time. Yet in all my experience in Lake Erie, I have never found the water as far from the shore, and deep, as in the place of the "Atlantic," muddy enough to make it total darkness at the distance of sixty feet below the surface. In the last work referred to, it conveys the idea in speaking of Mr. Harrington's exploit that one cannot see over sixty feet below the surface of the water, hence the remark on this point.

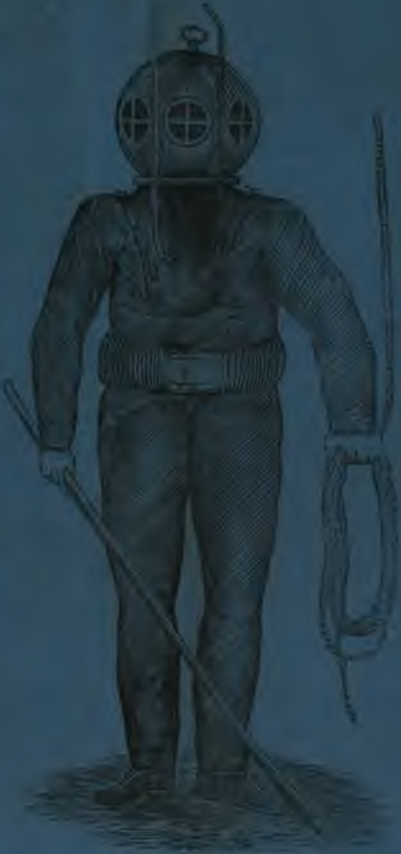
There is one question in connection with this statement of Mr. Harrington, which I wish to ask: will the gentleman tell the public how it happened that he saw persons in the cabin, referred to in a previous chapter, if it was total darkness? This is equaling Falstaff, when he said: "Three misbegotten knaves in kindall green, came at my back, and let drive at me; for it was so dark, Hal, that thou could'st not see thy hand."

Far be it from me to wish to take from Mr. Harrington any merit which rightfully belongs to him, or, rob him of the honor which he has gained in the perils of diving. I have only stated facts in the course of my experience, and should they differ from the naratives of other divers, all I request, is a careful comparison of the circumstances connected with the operation of each.

My operations as stated in this little work are well known to every man who was engaged or had business on Lake Erie at the periods mentioned, and I. think, accounts of the same will be found in the columns of most papers published in the several large cities bordering the Lakes, where my operations were made. That part of my accounts which were above water has its living witnesses—that part which was below, only remains " a tale," but the amount of money which it is known I expended, would indicate that I was very hopeful.

At the time I first became acquainted with the sub-marine armor, for a diver to remain down thirty minutes even in twelve to fifteen feet of water was a great adventure. This was the depth in which the operators were at work at the wreck of the "Griffith," and the short history and explanation of the art in both of the new publications the "Encyclopedia Britannica,"and "New AmericanCyclopedia," shows that it is not at the present date generally understood to the contrary. At the time I remained down at the "Griffith" about six hours, it was the longest time on record, that a diver had remained under water, and when I went down to the wreck of the "Erie," it was the greatest distance. These circumstances convince me, that I was the first person who tested the expedient of *having all the air that could be constantly forced into the armor, and consequently, it would be safe for the diver to go down to any depth as long as the air kept the armor inflated.* The imperfections which I found to exist in the construction of the old armor were not so serious but that the diver could descend as I did, even, to the depth of the "Atlantic," but with the greatest difficulty. The advantages of my new armor overcame much of that inconvenience, and made diving in deep water no more hazardous than that before practiced in from ten to fifteen feet in depth, with the old armor.

Perhaps the reader will be inclined to judge that I am saying too much in self-favor in regard to what I have done in improving diving apparatus; to this judgment I must reply,—look at what the art was when I first made it my profession, and that it has done since—what it was then, and what it is now! There is no diver which understands his business at the present time, but follows the principles laid down in this book; and I challenge any person to show those principles described in any publication previous to my diving to the "Atlantic," and I am quite positive they cannot be found in any other, even at the present time, and in this I have endeavored to give the true principles of diving with sub-marine armor, together with a description of the construction of that apparatus, and, also, narrated the most useful facts, connected with my extensive experience in sub-marine diving. I have given fully, that portion which I deem most useful in illustrating my profession in the course of the proceeding pages; I will draw my condensed labor to a close. I hope I have been able to so relate my experience, as to make it perfectly intelligible to the reader; for I have told "an unvarnished tale," nothing trusting to my powers as a writer; but only, to the facts which these pages contain for the amount of my literary undertaking; and I can but hope that I shall not be disapointed, by the reception it will receive from a generous public.



GREEN'S IMPROVED ARMOUR

CABOT SCIENCE LIBRARY

CANCELLED
APR 26 2007

AUG 29 2007
BOOK DUE

This book should be returned to the Library on or before the last date stamped below.

A fine of five cents a day is incurred by retaining it beyond the specified time.

Please return promptly.

CANCELED

1790 467

~~DUE APR 25 '42~~

~~DUE JAN 29 '44~~

JAN 8 '68 H

CANCELED

NS

~~DUE JAN 2 '48~~

c

CANCELED

DUE MAR 19 '49

CANCELED

Eng 5308.59
Diving with & without armor:
Cabot Science 005110284
3 2044 091 992 800